The Differential Effects of Three Mindfulness Techniques on Indicators of Emotional Well-being and Life Satisfaction

Marise Fallon
BPsycSci (Hons)

A report submitted in partial requirement for the degree of Master of Psychology (Clinical) at the University of Tasmania

I declare that this thesis contains no material which has been accepted for a degree or diploma by the University or any other institution and to the best of my knowledge and belief no material previously published or written by another person except where due acknowledgement is made in the text of the thesis.

Marise Fallon

May 2014

Acknowledgements

I am indebted to Dr Bruno Cayoun for having introduced me to mindfulness and providing so much wisdom, guidance and practical assistance to me while working on this project. Similarly, I would not have been able to conduct this research without the commitment of all participants involved in the mindfulness courses that were part of this study. I would also like to thank my parents, Mark and Mary Fallon, for their love and continuous support throughout all my years of education and I am eternally grateful to Mark Connolly for his love and support in so many ways throughout all stages of my Master's degree.

Table of Contents

List of Figures

List of Tables

Abstract

The efficacy of mindfulness-based therapies for treatment of a range of psychological presentations has been demonstrated by a substantial amount of research. The present study compared three specific mindfulness techniques: mindfulness of breath (MOB), body scanning (BS), and everyday mindfulness (EDM). A community sample of 263 was recruited to complete an 8-week course, with participants randomly assigned to MOB, BS, or EDM training groups of 8-10 people. Self-report measures of stress, anxiety, depression, life satisfaction, emotional regulation, and mindfulness were administered at baseline, after 4 weeks of training, at the completion of training, and 3 months post completion of the training. ANOVAs investigating change over time on each dependent variable as a function of training group were conducted with data for the 100 participants who remained for the duration of the study. Regardless of training type, between the start and finish of the 8-week course all 3 groups reported increases in life satisfaction and emotion regulation and decreases in symptoms of anxiety, depression, and stress. These gains were also maintained and recorded at 3 months post completion of the training. Unexpectedly, mindfulness scores were found to decrease. Significant time-by-group interactions were found for stress and emotion regulation only. There was a significant decrease in scores on stress between end of training and the 3-month follow-up only for participants in the EDM group; there was no difference in stress scores for participants in the MOB and BS groups. Difficulties in Emotion Regulation scores significantly decreased across the same time period for participants in the MOB and BS groups; while there was no significant change in the EDM group. These results provide some support for the greater efficacy of the formal meditative approaches (MOB and BS) compared to the informal EDM approach in providing gains that are maintained post-training.

The Differential Effects of Three Mindfulness Techniques on Indicators of Emotional Well-being and Life Satisfaction

The Eastern practice of mindfulness has existed for over 25 centuries (Kabat-Zinn, 1990). Kabat-Zinn's introduction of Mindfulness-Based Stress Reduction as a treatment for pain in 1979 (Kabat-Zinn, 1982) prompted the development of a number of mindfulness-based psychotherapies. Consequently, over the past 30 years there has been a widespread escalation of research into the physical, mental, and emotional outcomes experienced by individuals treated with mindfulness-based interventions. Given that an increasing number of clinicians integrate mindfulness techniques into their therapeutic practice, it is imperative that researchers investigate the functional properties of these techniques to ensure they are incorporated into therapy as effectively as possible.

While most mindfulness-based therapies include more than one mindfulness technique, there is a great deal of variation in the way in which this plays out in the therapeutic context. For example, some mindfulness-based interventions (e.g. Mindfulness-Integrated Cognitive Behavioural Therapy, MiCBT; Mindfulness-Based Stress Reduction, MBSR; Mindfulness-Based Cognitive Therapy, MBCT) emphasise different types of sitting meditations, some include yoga (e.g., MBSR), and some emphasise awareness of sensory experiences in everyday life (e.g., Dialectical Behaviour Therapy, DBT; Acceptance and Commitment Therapy, ACT). This variation in methods contributes to the complexity that arises when attempting to compare approaches and determine the benefits of the component techniques.

A chief area of concern in the Western use of mindfulness-based therapies stems from the fact that clinicians often privilege the use of certain mindfulness techniques over others despite a lack of demonstrated evidence that one is clinically superior to another. For example, MBSR and MBCT emphasise the practice of mindfulness of breath, whereas MiCBT emphasises another meditative technique, body scanning. In an attempt to shed light on this previously ignored question of comparative efficacy, the present study compares three of the most commonly used mindfulness techniques – body scanning, mindfulness of breath, and everyday mindfulness – with the aim of assessing their relative efficacy within a community sample.

The variety of mindfulness techniques available, as well as varying conceptualisations of the construct of mindfulness in the West, has led to a lack of consistency in its application as a therapeutic method by clinicians (e.g., Lindsay, 2007). In part because of these inconsistencies, there is also a current lack of any valid and sensitive measure of mindfulness itself. Adding further difficulty, when reviewing research examining the utility of mindfulness-based interventions, there is commonly a lack of precision in the description of the specific techniques and delivery procedures used. In such articles it is often unclear exactly how mindfulness training was implemented and which technique was used, making replication in clinical settings difficult. In order to address this gap in the literature and assist in identifying the technique that most benefits clients, this study will directly compare the independent effects of mindfulness of breath, body scanning, and non-meditative informal mindfulness practise (everyday mindfulness). The following review will define the construct of mindfulness, provide a brief outline of the applications and efficacy of mindfulness-based interventions, and investigate evidence for hypotheses regarding the functional components of these three mindfulness techniques.

Mindfulness Defined

In the context of Western psychology, mindfulness has been defined as the experience of being non-judgementally aware of, and attentive to, the present moment (e.g., Allen, Chambers, Knight, & Melbourne Academic Mindfulness Interest Group, 2006; Brown & Ryan, 2003; Frewen, Evans, Maraj, Dozois, & Partridge, 2008; Kabat-Zinn, 1990). Different authors have presented mindfulness as an intrinsic personal trait (Brown & Ryan, 2003; Frewen et al., 2008), as an approach to everyday life that involves attending more consciously to one's experiences (Davidson, 2010), and as a change in cognition that arises through the regular practise of formal mindfulness meditation (Cayoun, 2011; Kabat-Zinn, 1990).

Mindfulness, in its most easily traceable form, is a formal meditative approach that originated in Theravada Buddhism over 25 centuries ago within a broader meditative system named *Vipassana* ("insight") meditation (Hart, 1987). The subsequent use of mindfulness by different Buddhist traditions led to the development of a variety of mindfulness practices. In comparison, the construct of mindfulness in Western psychology is still in its infancy and is mostly used in isolation from its broader philosophical context. Lindsay (2007) points out that amongst Western mindfulness researchers and clinicians there is still confusion regarding the use of the word and its definition. Currently the Western conceptualisation of mindfulness spans all of the following: an outcome, a practice, a therapeutic process, a technology, a state, and a trait. The present study uses the term to refer to both a practice and a state-based outcome, ensuring that for each use the intended definition is made clear.

Applications of Mindfulness

As mentioned, there are a number of structured mindfulness-based interventions currently used by Western clinicians. MBSR (Kabat-Zinn, 1990), developed as a treatment for chronic pain, is now used to treat a growing number of physical and psychological conditions. MBCT is a variation of the 8-week MBSR programme, which has been associated with an approximately 50% reduction in depressive relapse in chronically depressed patients over a two-year period (Segal, Williams, & Teasdale, 2002). MiCBT (Cayoun, 2011) combines traditionally-delivered mindfulness meditation and Cognitive Behaviour Therapy as a treatment for a range of psychological disorders and chronic pain. Mindfulness is also a component of DBT (Linehan, 1993), mostly used to treat Borderline Personality Disorders. ACT (Hayes et al., 1999) combines mindfulness principles with behaviour modification and cognitive techniques to reduce a range of psychological symptoms.

A plethora of studies have provided evidence for the efficacy of mindfulness-based treatment. For example, meta-analyses have indicated that mindfulness-based interventions are efficacious in the treatment of: depressive symptoms (Klainin-Yobas, Cho, & Creedy, 2012; McCarney, Schulz, & Grey, 2012); psychiatric disorders (Chiesa & Serretti, 2011); eating disorders (Wanden-Berghe, Sanz-Valero, & Wanden-Berghe, 2011), and a variety of other psychological presentations (e.g., Khoury, Lecomte, Fortin, Masse, Therein, Bouchard, et al., 2013). Further, research with non-clinical populations has provided evidence that mindfulness training can also improve psychological well-being (Astin, 1997; Eberth & Sedlmeir, 2012; Shapiro, Schwartz, & Bonner, 1998; Williams, Kolar, Reger, & Pearson, 2001) and physical heath (Williams, Kolar, Reger, & Pearson, 2001).

Functional Components of Mindfulness

In an attempt to better understand its mechanisms of action, recent mindfulness research has begun investigating the functional components of mindfulness meditation and mindfulness-based interventions. Regardless of the technique used, mindfulness involves a clear and accepting awareness of sensory and cognitive experiences that arise within the present moment. This non-judgemental awareness is said to allow for a more accurate conscious appraisal of everything we encounter, providing the opportunity for more effective action to be taken than would be likely if one were simply reacting automatically (Kabat-Zinn, 1990).

From a behavioural perspective, the awareness component of mindfulness has been likened to exposure methods (Hayes & Wilson, 2003; Kabat-Zinn, et al., 1992; Linehan, 1993). During mindfulness practise, one notes arising experiences, whether internally-generated body sensations and thoughts, or externally-generated sensory events, and simultaneously inhibits their usual ("automatic") reaction. This sustained non-reactive awareness leads to what learning theorists would describe as the extinction of our usual reactive habits and desensitisation to perceived unpleasant thoughts and body sensations (Hayes, Follette, & Linehan, 2004; Hayes, Strosahl, & Wilson, 1999). When being mindful, one does not avoid unwanted experiences, allowing for the removal of contingencies that reinforce and maintain usual reactive habits. Cognitive-behavioural theorists have also conceptualised mindfulness in terms of training to be able to disengage from automatic behavioural and cognitive tendencies (Langer, 1989, 1992; Roemer & Orsillo, 2002; Teasedale, 1999; Wells, 2002).

Over the past decade, researchers have commenced investigations into the neurological effects of mindfulness. Both short- and long-term mindfulness practise has been shown to produce visible structural changes in areas of the brain that are congruent with the tasks involved in mindfulness meditation practise. Imagery and electroencephalographic (EEG) studies have indicated that lasting changes occur in the amygdala (Way, Creswell, Eisenberger, & Lieberman, 2010), left anterior temporal activation (Davidson et al., 2003), and grey matter in the right orbitofrontal cortex and the right hippocampus (Luders, Toga, Lepore, & Gaser, 2009). Furthermore, neurological research has indicated that mindfulness meditation may lead to increased grey matter volume in the somatosensory cortex, the right anterior insula and the prefrontal cortex (Luzar et al., 2005), posterior insula (Kirk, Downar, & Montague, 2011), and lateral prefrontal cortex, insula, secondary somatosensory cortex and inferior parietal lobule (Farb et al., 2007).

Several researchers have hypothesised that practising experiential awareness and non-reactivity through mindfulness meditation may train the brain to process stressful information increasingly in the prefrontal cortex and simultaneously decrease the amount of processing that occurs in the emotional pathways of the limbic system, which is usually activated automatically in stressful situations (Davidson et al., 2003; Goleman, 1976; Schwartz, 1975). Continuous practise is purported to allow one to develop this more frontal and rational approach to coping with life stressors (Cayoun, 2011; Kabat-Zinn, 1990). Within Buddhist schools of thought this non-reactive attitude is called "equanimity".

Three Common Mindfulness Techniques

Mindfulness of Breath.

When practising formal mindfulness of breath meditation, one focuses attention on the ongoing somatosensory feedback produced by the breath. The meditator attempts to be continuously aware of sensations at the entrance to the nostrils or the sensations of the rising and falling of the stomach. When thoughts arise, the meditator gently accepts that a mental event ("thinking") has occurred, moves their attention away from the thought, and refocusses attention on the breath. Hart (1987) points out that this practice is an exercise in awareness, not a breathing exercise, and states that through the practise of one-pointed focus, the ability to resist distractions and maintain concentration is heightened.

Functional components.

Researchers and mindfulness practitioners have proposed a number of hypotheses regarding the mechanisms underlying the changes that result from the regular practise of mindfulness of breath meditation. Traditionally, Buddhist teachers claim that while one is lost in thoughts about the past or the future, often craving for their present situation to be otherwise (Vipassana Research Institute, 1990), one is unable to connect with, fully experience, and learn from that which is happening in the present (Gunaratana, 2005; Hart, 1987). In *Vipassana* meditation, mindfulness of breath is viewed as an ideal way to practise present moment awareness.

A technique which focuses on internally-generated experiences of the mind, there appears to be some fundamental cognitive skills that develop when one practises mindfulness of breath. Metacognitive insight is the ability to know the nature of one's thought patterns, rather than the content of particular thoughts (Teasdale, 1999), and to identify when a thought has arisen. When this skill is cultivated through sustained attention towards the breath, it allows one to dis-identify from the content of thoughts (Teasdale et al., 2002). Traditionally termed "mind awareness" in the East (Narada, 1968), this skill enables one to see thoughts for what they are, let go of them more easily, and view their content more objectively, contributing to the cultivation of calm and relaxation. Many researchers have argued that the benefits of mindfulness-based practices have their origins in the ability to teach people to disengage from the content of their thoughts in this way (e.g., Langer, 1981, 1992; Roemer & Orsillo, 2002; Segal, Williams, & Teasdale, 2002; Teasedale, 1999; Teasdale et al., 2002; Wells, 2002).

Cayoun (2011) suggests that, in addition to metacognitive insight, there are three major cognitive skills that develop through the practise of mindfulness of breath: sustained attention, response inhibition, and response re-engagement through attention shifting. According to Cayoun, improvement in these skills is observed through the meditator's decreasing distractibility during meditation and their increased ease of switching attention back to the breath after having been distracted. These executive abilities require the meditator to inhibit their automatic patterns of reaction to thought content and process. Cayoun argues that this continuous monitoring of thought, reallocation of attention, and the resultant increase in skills of metacognitive awareness, response inhibition, and cognitive flexibility, leads to an improved ability for self-control.

An information processing analysis of mindfulness meditation highlights the development of similar skills and their importance in terms of the effect of mindfulness practise on emotion regulation (Wells, 2002). Wells states that mindfulness enables one to: activate a metacognitive approach to processing, disconnect from the influence of thought content and maladaptive beliefs, improve ability for flexibility in one's response to an event, and improve metacognitive strategies for controlling one's attention.

Body Scanning.

Body scanning involves systematically scanning the body for sensations whilst preventing any reaction or value judgement towards sensations that are detected. Although various body scanning techniques exist, the one used in this study (and hereafter discussed) is part of the Burmese *Vipassana* method. When practising this technique the meditator brings their awareness to the body, "scanning" from head to toe, part-by-part, while attempting to remain non-judgemental and non-reactive (i.e., "equanimous"), regardless of whether sensations are detected or not, and regardless of the type of sensation felt when sensations are perceived. Over weeks of practise, the meditator notices sensations appearing in areas where previously no sensations were detected, becomes able to detect more subtle sensations, and is able do so with increasing rapidity. These developing skills allow the meditator to progressively scan larger portions of the body.

Functional components.

The primary aim of body scanning is to develop awareness and acceptance of one's spontaneously emerging experience, whether pleasant or unpleasant, and to reduce reactivity. As when practising mindfulness of breath, when practising body scanning the meditator maintains an alert watchfulness for thoughts that distract them, constantly bringing their attention back to the focus of the meditation. As a result, metacognitive insight, response inhibition, sustained attention, and cognitive flexibility skills that are cultivated during the practise of mindfulness of breath are also cultivated while body scanning. Body scanning, however, extends this process to include re-training in perception of and reaction to bodily sensations as well as to events of the mind, thereby allowing the process of changing one's reactivity to include a broader range of experience types, including both physical as well as mental experiences.

From a neurological perspective, body scanning appears to promote specific structural changes within several regions of the brain. It has been hypothesised that the increasing ability of the meditator to detect sensations, and to do so in different areas of the body simultaneously, may reflect an increase in connections within particular neural networks (Cayoun, 2011). Cayoun argues that such changes account for the increasing rapidness with which bodily sensations are detected, as well as the meditator's improved ability to detect more subtle sensations. This ability to rapidly detect even subtle sensations within the body enables the meditator to detect early interoceptive cues of distress in daily life and regulate emotions effectively, having also acquired a better ability to choose their response to perceived sensations (emotions), rather than reacting automatically according to established habits. Reflecting this process, body-scanning has been operationalised in behavioural terms as "generalised interoceptive exposure and response prevention" (Cayoun, 2011, p. 49).

One recent theory that provides an in-depth explanation of the functional components of the body scanning technique is Cayoun's (2011) Co-emergence Model. This model purports that, by shifting attention away from the judgemental and reactive parts of our natural response to experiences, and reallocating attention to sensory perception, through the practise of body scanning the meditator learns to remain non-judgemental and accepting of their own emotional experience (see Appendix A for a more detailed summary of this model and Cayoun (2011) for further details). This ability to remain equanimous towards thoughts and emotions, which are experienced as sensations in the body, is argued to be the key outcome of body scanning practise that leads to improved emotional well-being.

Everyday Mindfulness.

Mindfulness in everyday life is an important aspect of Buddhist teaching that involves consciously applying attention to one's own experiences throughout the day.

In the West, it is often called "informal practise" (Kabat-Zinn, 1990) and is commonly taught within mindfulness-based interventions (e.g., MBSR, MBCT, MiCBT) as an adjunct to formal "sitting" meditation practise. Those receiving mindfulness-based interventions are often also directly asked to consciously pay attention to their experiences in daily life. For meditators this is thought to encourage the continuity of skill development between meditation sessions, encouraging the more rapid application of skills developed during meditation to life outside of meditation (*generalisation* in behavioural psychology). Furthermore, some Western therapists implementing mindfulness-based therapies such as ACT and DBT frequently ask clients to pay conscious non-judgemental attention to aspects of their daily life without requiring the practise of any formal sitting meditation. The everyday mindfulness (EDM) course used in this study is an example of such an approach.

Functional components.

Several ideas have been proposed regarding the advantages of mindfulness practise without formal meditation. As many authors on the subject have pointed out, the human mind spends a lot of time remembering pleasant or unpleasant events from the past, or anticipating what may occur in the future, preventing us from experiencing the reality unfolding in the present (e.g., Gunaratana, 2005; Harris, 2007; Hayes, Strosahl, & Wilson, 1999; Kabat-Zinn, 1990; Tolle, 2005). It is through the lack of awareness of actions, performed in the present moment, that one is likely to continue repeating the same mistakes, disallowing the present to serve as a guide from which one can continue to learn (Hart, 1987; Margolis & Langer, 1990).

Some authors have also pointed out the impossibility of such mindfulness of the present moment existing simultaneously with experiential avoidance (e.g., Gunaratana, 2005; Hayes et al., 1999 Kabat-Zinn, 1990). Experiential avoidance has been linked to the development of psychopathology, either implicitly or explicitly, in a number of therapeutic approaches, including client-centred therapy, gestalt therapy, behavioural therapies, cognitive therapy, and more recently as a central theme in DBT and ACT (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). Lack of experiential avoidance, practised in everyday life, allows problems to be dealt with and emotions to be experienced as they arise rather than being left unresolved – preventing maladaptive coping patterns resulting from of lack of opportunity to develop different coping methods.

Arguably, however, for people who experience relief from their emotional distress by using avoidance techniques, being asked to pay attention to painful emotions and experiences could initially lead to increased distress rather than acceptance. This is particularly relevant for everyday mindfulness: while mindfulness of breath and body scanning require specific time to be devoted to the formal cultivation of acceptance and mindfulness skills through daily meditation; everyday mindfulness does not include the formal cultivation of these skills through meditation.

The Present Study

Research to date has not directly compared the efficacy of different mindfulness techniques used in mindfulness-based interventions. Consequently, clinicians who emphasise one skill set over another may fall short of replicating the results produced by others who may have emphasised a different skill set. The experimental research conducted for the present thesis will investigate the differences in the impact of 8 weeks of training in mindfulness of breath (MOB), body scanning (BS), or everyday mindfulness (EDM) on a community sample.

Mindfulness is commonly measured through self-report questionnaires, however the validity of such measures has been questioned (e.g., Bergomi, Tschacher, & Kup- per, 2012; Davidson, 2010; Van Dam, Earleywine, & Danoff-Burg, 2009). Thus, to assess changes experienced during and after each of the three training programmes the present study will employ additional measures in conjunction with a mindfulness self-report questionnaire. Changes on self-report measures of anxiety, depression, stress, emotion regulation, and life-satisfaction will also be assessed. Finally, the relationship interoception (the extent to which one can feel sensations within their body) and time spent meditating have with these outcome measures will also be assessed.

Based on the research and theory reviewed, three hypotheses are proposed. The first hypothesis stems from an understanding of the differences between formal mindfulness meditation techniques and mindfulness in everyday life. The former involve more of an internal focus and a greater amount of time spent specifically and intensively cultivating mindfulness skills through meditation practise, whereas the latter technique has comparatively a more external focus. It is hypothesised that participants in the MOB and BS groups will experience more substantial decreases in stress, anxiety, depression and difficulties in emotion regulation as well as greater increases in mindfulness and life satisfaction than those in the EDM group (Hypothesis 1). In addition, it is predicted that these improvements will be more pronounced for those in the BS group than those in the MOB group (Hypothesis 1a). This secondary hypothesis reflects the discussed benefits in body scanning that result from an emphasis on bodily sensations in addition to thoughts. This is argued to be an important aid in the development of emotion regulation skills, particularly in the context of Cayoun's (2011) Co-emergence Model, which purports that one's reactivity to perceived sensations in the body plays a crucial role in one's experience of emotions.

As the ability to feel sensations within the body (i.e., interoception) is thought to be inextricably linked to the emotion regulation benefits of body scanning practise, it is hypothesised that there will be a positive correlation between scores reflecting participants' change over time on the interoception measure and scores reflecting change over time on other outcome variables. It is expected, however, that a general increase in mindfulness awareness will increase participants' awareness of daily experiences, including bodily sensations, and that this will occur for participants regardless of the type of mindfulness in which they are trained. Therefore, the positive correlation between interoception and change over time on all dependent variables is expected to occur for all groups, though most predominantly for those in the BS group (Hypothesis 2). Finally, as formal practise provides an intensive opportunity for all aforementioned mindfulness abilities related to mindfulness of breath and body scanning to develop, it is predicted that there will be a positive correlation between improvements over time (scores reflecting change over time) for those in the MOB and BS groups and the amount of meditation practise completed at home (Hypothesis 3), such that more time spend meditating at home will be associated with more substantial improvements over time.

Method

Participants

Participants were initially recruited through a newspaper article (Appendix C), newspaper advertisement (Appendix B), live radio interview with the experimenter, and posters (Appendix D) (placed throughout the community on noticeboards, in a variety of stores, and around the Sandy Bay campus of the University of Tasmania). The advertisements offered the opportunity for free training in an ancient Eastern mindfulness meditation technique. Varied recruitment methods and venues were used to ensure participants represented a good cross-section of the community within the Hobart metropolitan area.

People with long-term (more than 6 months) or recent (in the previous two years) meditation or yoga experience were excluded from the study to reduce the potential for confounds related to existing mindfulness skills. A structured 45-minute interview was used to gather information on the participants' age, current life situation, mental health, commitment to the programme, expectations for the programme, current medications, physical disabilities, previous trauma, and drug and alcohol use (see Appendix E for Assessment Interview). To ensure all participants received the same level of support and training, participants assessed as potentially having psychopathology that would require significantly more one-on-one support were advised that mindfulness training would be more beneficial to them if delivered by a psychologist who could provide individualised training and professional support. This process led to a final sample of 100 participants. Since the process for final entry into the study was complex it is represented in Figure 1 for ease of understanding.

Figure 1. Flow of Participants Through From Recruitment to Inclusion in the Randomised Control Trial and the Final Analyses

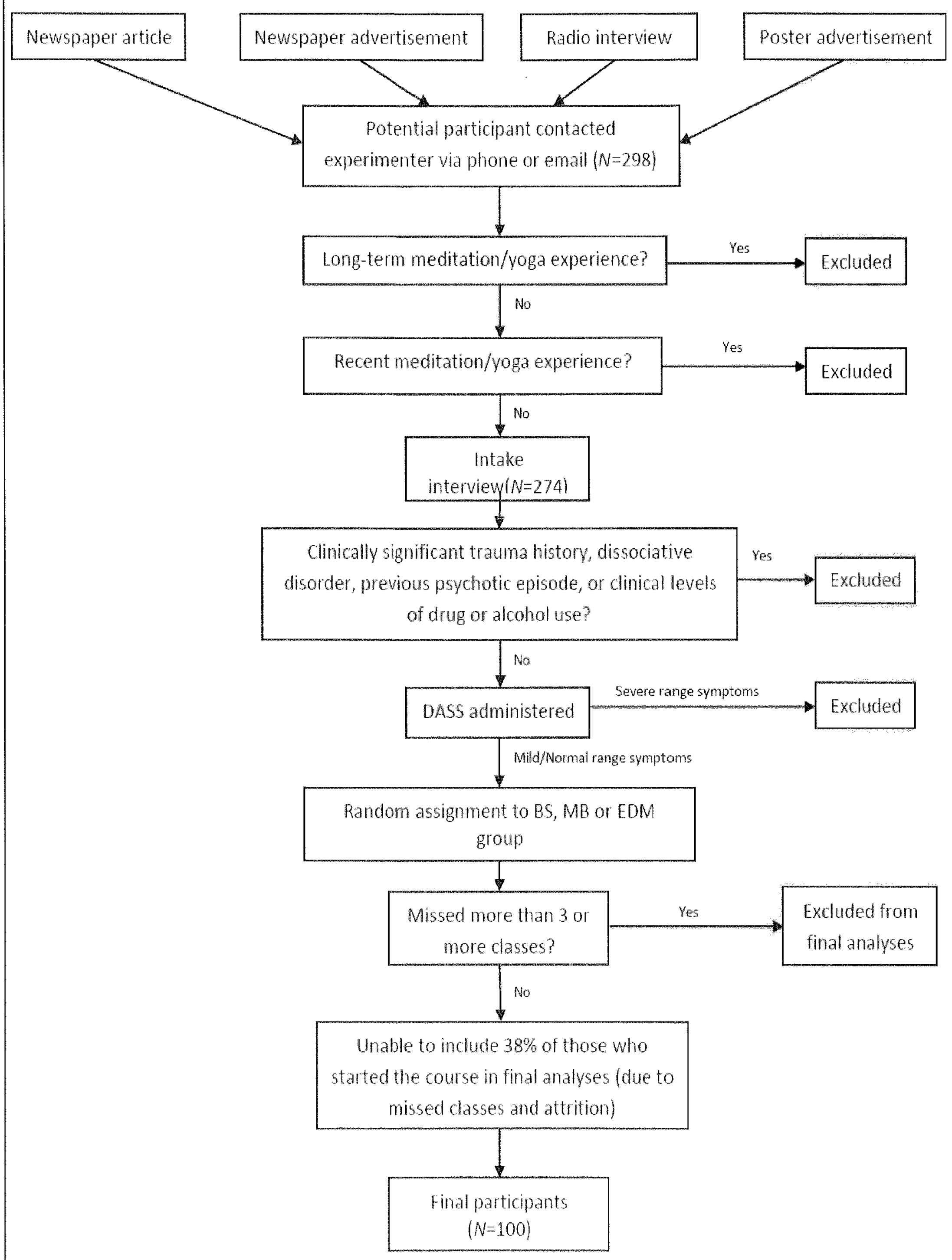


Figure 1. Participant flow chart depicting the process from recruitment to final analyses. *Excluded* = Excluded from participating at all. *Excluded from final analyses* = Attended group classes, however data for week 8 and 3 month follow-up not used in final analysis.

The age of final participants included in analyses ranged from 18 to 75 years old, with a mean age of 46.13 (SD = 14.53). Of the participants included in the final analyses, 32 were in the everyday mindfulness (EDM) group, 40 were in the mindfulness of breath (MOB) group, and 28 were in the body scanning (BS) group. Further details of the sample are outlined in Table 1.

Table 1

Participant Demographic Details

Demographic Info	Category	Percentage of Total
Gender	Female	77
	Male	23
Age range	18 – 25 years old	6
	26 – 35 years old	13
	36 – 45 years old	22
	46 - 55 years old	17
	56 – 65 years old	23
	66+	10
Highest Level of Education	High School	10
	Trade/Apprenticeship	4
	Certificate/Diploma	29
	Undergraduate Degree	24
	Postgraduate Degree	25
Marital Status	Never Married/Single	18
	De Facto/Married	55
	Separated/Divorced	16

	Widowed	2
Yearly Income	$0 - $20000	23
	$21000 - $40000	31
	$41000 - $80000	24
	$81000 +	12

Note. Since the total number of participants was 100, N is not included to prevent repetition. Percentages do not add up to 100 as a result of missing data for some participants.

Materials

Depression, anxiety, and stress were measured using the DASS21 (Lovibond & Lovibond, 1995; Appendix F). This 21-item self-report questionnaire was designed to assess the frequency of a range of cognitive and emotional indicators for these three clinical variables. The DASS21 examines the frequency and severity of symptoms experienced by an individual over the past week. Items on the DASS21 are scored on a 4-point Likert scale. The questionnaire has adequate levels of construct validity, reliability, and internal consistency, with subscale Cronbach alpha scores of .88 for Depression, .82 for Anxiety, and .92 for Stress (Henry & Crawford, 2005). The DASS21 has also demonstrated good internal consistency and concurrent validity for both clinical and non-clinical samples (Antony, Bieling, Cox, Enns, & Swinson, 1998).

The Satisfaction with Life Scale (SWLS; Diener, Emmons, Larson, & Griffin, 1985; Appendix G) measures self-reported global life satisfaction. The SWLS contains five items that require responses on a 7-point Likert scale. It has good construct validity, test-retest reliability over a 2-month period (.82), and high internal consistency ($\alpha = .87$) (Deiner, Emmons, Larsen, & Griffin, 1985).

The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004, Appendix H) is a 36-item self-report questionnaire intended to measure one's ability for emotion regulation. An exploratory factor analysis of the scale, using a non-clinical sample, has identified six separate, though related dimensions: (a) awareness of emotional responses, (b) clarity of emotional responses, (c) acceptance of emotional responses, (d) limited access to perceived effective emotion regulation strategies, (e) difficulty controlling impulses when experiencing negative emotions, and (f) difficulty engaging in goal-directed behaviour when experiencing negative emotions (Gratz & Roemer, 2004). The DERS has high internal consistency (.93), good construct and predictive validities, and good test–retest reliability over a period of 4 to 8 weeks (.88) (Gratz & Roemer, 2004). The DERS has good construct validity amongst adult clinical samples (Gratz, Rosenthal, Tull, Lejuez, & Gunderson, 2006) and has demonstrated to be sensitive to change after successful clinical intervention (Gratz, Lacroce, & Gunderson, 2006; Gratz & Gunderson, 2006)

The Five Facet Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; Appendix I) contains 39 items that are designed to measure an individual's level of mindfulness ability in terms of five identified primary characteristics: acting with awareness, being accepting and non-judgemental, being accepting and non-reactive, observing one's own experience, and the ability to describe one's own experience. Responses to items are provided on a 5-point Likert scale. These subscales have good internal consistency, as demonstrated by the following Chronbach alpha scores: nonreactivity = .75, observing = .83, acting with awareness = .87, describing = .91, and nonjudging = .87 (Baer et al., 2006). Confirmatory factor analysis has provided further support for the same five-factor model (Fernandez, Wood, Stein, & Rossi, 2010).

Interoception was measured using the Interoception Form (Cayoun, 2011; Appendix J), which is a visuo-spatial measure of interoceptive ability that requires participants to shade areas within the silhouette of a body that depict areas in which they can feel sensations in the body. There is currently no research regarding the psychometric properties of this form; however, there are no existing alternative forms to serve as a measure of mindfulness-based interoceptive ability. The Interoception Form is currently used by numerous clinicians.

Participants in the MOB and BS groups completed the Daily Schedule of Mindfulness Practise form (Cayoun, 2011; Appendix K) weekly, to provide a record of their meditation practise for the duration of the 8-week programme. Each participant in the MOB and BS groups also received audio CDs containing guided meditation tracks selected from Mindfulness Training Stage 1 (Cayoun, 2003a) and Mindfulness Training Stage 2 (Cayoun, 2003b) to teach advanced body scanning skills, for which permission to copy had been obtained from the author (see Appendix L for track listings of provided CDs). These CDs provided participants with simple instructions for home practise of the mindfulness of breath technique (see script Appendix M) and the body scanning techniques (see Appendix N for scripts).

Design

A 3 x 4 mixed-measures factorial design was used. The independent variables were Group (MOB, BS, EDM) and Time (baseline, mid-training, post-training, and 3-month follow-up). The dependent variables for this study were the scores on each of the questionnaires used in this study: the SWLS, the DERS, and the FFMQ as well as the three scales from the DASS21 questionnaire. Measures of interoception and frequency and duration of practise were also used in supplementary correlational analyses.

Procedure

Prior to participation, participants were informed of the purpose of the study, the possibilities of potentially distressing memories resurfacing during practise, and of the confidential nature of obtained data. Participants signed a consent form before the study commenced. To ensure confidentiality, a code number was assigned to each participant, the data were stored in a secure area, and access to the data was limited to the experimenters. Participants were randomly allocated to either the MOB, BS, or EDM group using a block randomisation procedure. Currently there are an abundance of randomised controlled trials evaluating the efficacy of mindfulness techniques for improving psychological well-being compared to different types of control groups. The purpose of this study was not to look into the efficacy of mindfulness training compared to, for example, relaxation training or waitlist controls, but to investigate the comparative efficacy of different kinds of mindfulness training and practise. This type of comparison did not exist in the literature prior to the present study, with previous research having investigated only one type of mindfulness training per study. For this reason no control group was used. Participants within each group were allocated to a weekly class with 8 to 10 other individuals and were required to attend this 1-hour class once a week for 8 weeks. Over the course of the 8-week mindfulness training programs, no significant adverse experiences were reported.

All participants completed a battery of questionnaires, containing the DASS21, SWLS, DERS, FFMQ, and the Interoception Form at four different time points: 1) during week 1 of class, before commencing any mindfulness practise; 2) during week 5 of class, after having completed 4 weeks of the programme; 3) at the completion of their 8th week of the programme (these were posted back to the experimenter in a reply-paid envelope supplied by the experimenter); 4) and at a 3-month follow-up meeting (or via post if unable to attend). This data provided scores on the dependent variables at baseline, halfway through the programme, at the completion of the programme, and at follow-up. Some participants discontinued due to health reasons or due to their inability to commit to class attendance or homework tasks. These participants were not included in the final analyses. Similarly, participants who did not attend three or more classes were also not included in the final analyses. Overall, 38% of those who began the training were not included in the final analyses. The number of participants who dropped out of the study prior to its completion was not significantly different between the groups.

All mindfulness classes were held in the same classroom on the Sandy Bay campus of the University of Tasmania. To rule out teacher effects, the experimenter, who was trained in the teaching of mindfulness meditation, conducted all classes. This teacher was a Masters of Clinical Psychology student with 12 months personal regular mindfulness meditation practise. The teacher had completed a Mindfulness Integrated Cognitive Behaviour Therapy (MiCBT) course for professionals and was supervised by an experienced mindfulness meditation teacher with over 22 years personal meditation experience.

Each class was clearly structured and scripted to ensure minimal differences between class content. Appendix O provides an outline of the 8-week programme for each group. See Cayoun (2011) for full details of body scanning teachings in mindfulness meditation (including the following different body scanning techniques: unilateral part-by-part scanning, symmetrical scanning, partial sweeping, sweeping en masse, transversal scanning, and sweeping en masse in depth).

The programme for each of the three groups was created specifically for the purpose of this study, attempting to reflect, as much as possible the common elements that are taught in traditional and Western approaches to mindfulness training. Efforts were made to ensure that, within the requirements of each different group programme (MOB, BS, or EDM) the type and amount of information and support provided was kept constant. The formal mindfulness techniques used were traditional Burmese Vipassana methods of mindfulness meditation, which are commonly used in the West and often simplified and integrated within various therapy approaches.

Results

Data were analysed using STATISTICA version 7 with supplementary analyses completed using SPSS version 19. Normality assumptions were met for all variables used and an alpha level of .05 was adopted for all analyses conducted.

Chi Square tests were used to compare categorical demographic information for those participants who were included in the final analyses with those who were not. These analyses indicated that the participants included in the final analysis were not significantly different to those excluded in terms of age group, gender, education level, marital status, current work status, income, and previous or current mental illness diagnosis (see Appendix T for output).

Frequency of missing data was calculated for two data sources: the results of the dependent variable questionnaires, and the results of at-home medication practise records completed by participants in the mindfulness of breath (MOB) and body scanning (BS) groups. Missing data was found to be 0.54% for the questionnaires and 28.22% for practise data (this higher rate is most probably the result of these questionnaires being completed at home and frequently lost). Importantly, there were no significant differences in missing data between groups.

Participant Details

Chi square tests were used to evaluate differences amongst the three groups (BS, MOB, and everyday mindfulness (EDM)) at baseline on the categorical demographic variables of age group, gender, level of education, marital status, and income. These analyses indicated that there were no significant differences between the groups on any of these variables (see Appendix U for statistical output). One-way ANOVAs were also used to evaluate differences amongst the three groups at baseline on each of the dependent variables: anxiety, stress, depression, difficulties in emotion regulation (DERS), mindfulness, and life satisfaction. See Table 2 below for means and standard deviations for each of the groups on these dependent variables at baseline.

Table 2

Means and Standard Deviations on DVs at Baseline for MOB, BS, and EDM groups

Dependent Variable	M	SD
DERS		
MOB	23	23
BS	94	26
EDM	83	18
Stress		
MOB	11	5
BS	9	5
EDM	8	5
Anxiety		
MOB	6	5
BS	9	5
EDM	4	4
Depression		
MOB	7	6
BS	5	4
EDM	5	4
Life Satisfaction		
MOB	23	7

BS	21	7
EDM	24	6
Mindfulness		
MOB	117	5
BS	118	5
EDM	117	5

There were no significant differences between groups for: anxiety, $F(2, 97) = 2.07$, $p = .130$, $\eta^2_p = .04$; stress, $F(2, 97) = 2.70$, $p = .071$, $\eta^2_p = .05$; depression, $F(2, 97) = 1.43$, $p = .244$, $\eta^2_p = .02$; mindfulness, $F(2, 97) = 0.75$, $p = .475$, $\eta^2_p = .01$; or life satisfaction $F(2, 97) = 0.93$, $p = .397$, $\eta^2_p = .01$. A significant difference between groups was found for the DERS variable, however, $F(2, 97) = 3.20$, $p = .044$, $\eta^2_p = .06$. Tukey's HSD post-hoc analyses revealed that the MOB group scored significantly higher than the EDM group, $p = .048$; there was no significant difference between the EDM and BS groups, $p = .134$; and there was no significant difference between the MOB and BS groups, $p = .961$ (refer to Appendix V for all statistical output related to these ANOVAs).

Intervention Effect

Hypothesis One.

It was hypothesised that those in the MOB and BS groups would experience more substantial decreases in stress, anxiety, depression and DERS as well as greater increases in mindfulness and life satisfaction than those in the EDM group. In addition, it was expected that these improvements would be more pronounced for those in the BS group than those in the MOB group. Repeated measures ANOVAs with Greenhouse-Geisser correction were used to assess these predictions. The results of these analyses are displayed in Table 3.

Table 3

Repeated Measures ANOVAs, change over time, MOB, BS, and EDM groups.

Dependent Variable	Time by Group Interaction & Effect Size	Main Effect of Time & Effect Size
DERS	$F(6, 291) = 2.16, p = .047, \eta^2_p = .04$	$F(3, 291) = 111.60, p<.0001, \eta^2_p = .53$
Stress	$F(6, 291) = 2.33, p = .033, \eta^2_p = .05$	$F(3, 291) = 43.62, p <.0001, \eta^2_p = .31$
Anxiety	$F(6, 291) = 1.66, p = .132, \eta^2_p = .03$	$F(3, 291) = 29.17, p <.0001, \eta^2_p = .23$
Depression	$F(6, 291) = 2.00, p = .065, \eta^2_p = .04$	$F(3, 291) = 27.53, p <.0001, \eta^2_p = .22$
Life Satisfaction	$F(6, 291) = 1.30, p = .256, \eta^2_p = .03$	$F(3, 291) = 20.00, p <.0001, \eta^2_p = .17$
Mindfulness	$F(6, 291) = .8, p = .534, \eta^2_p = .17$	$F(3, 291) = 13.40, p <.0001, \eta^2_p = .12$

These results indicate that there was a significant main effect of time for each DV such that, regardless of training group, participants reported a significant change over time in their scores on each of the dependent variables. There were also significant time x group interactions on stress (see Figure 2) and DERS (see Figure 3), with the time x group interaction approaching significance for depression (see Figure 4).

To follow up the two significant interactions, follow-up tests of pairwise comparisons for individual means were completed using the false discovery rate (FDR) procedure (Benjamini, 2010; Benjamini & Hochberg, 1995; Curran-Everett, 2000) to control the family-wise error-rate and Hedges' g is reported as an effect size for the difference between 2 points where appropriate. Nine comparisons between

Figure 2. Repeated Measures ANOVA: Change Over Time for DASS Stress

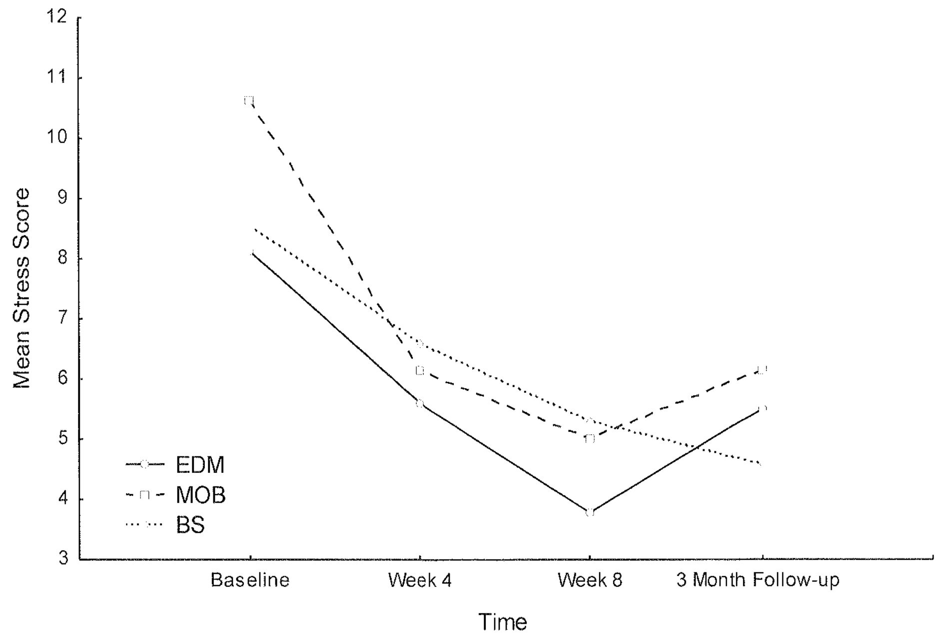
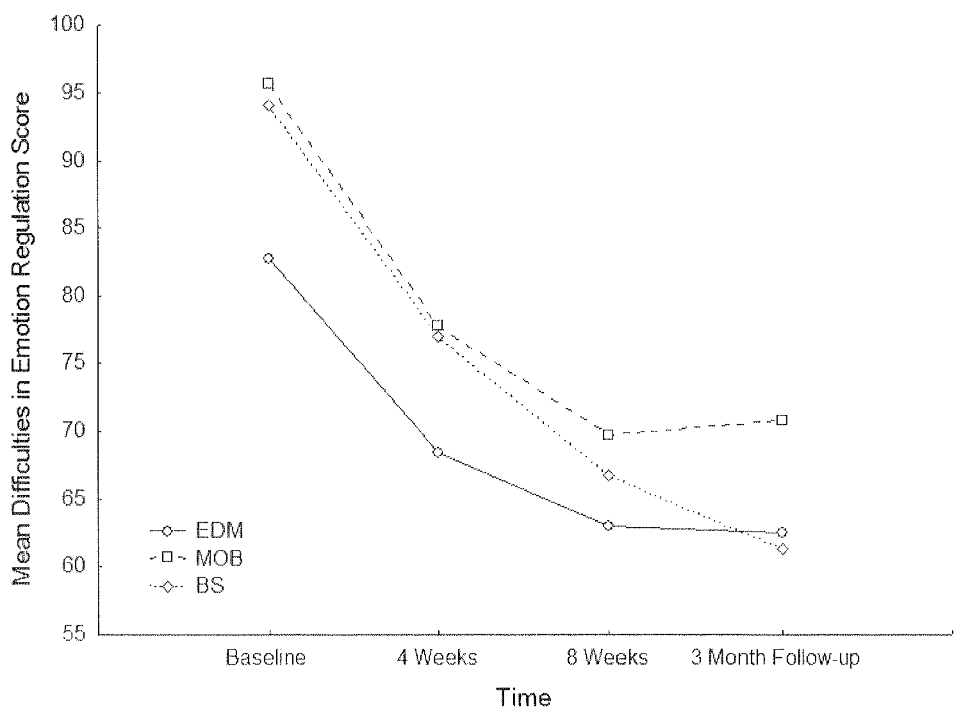
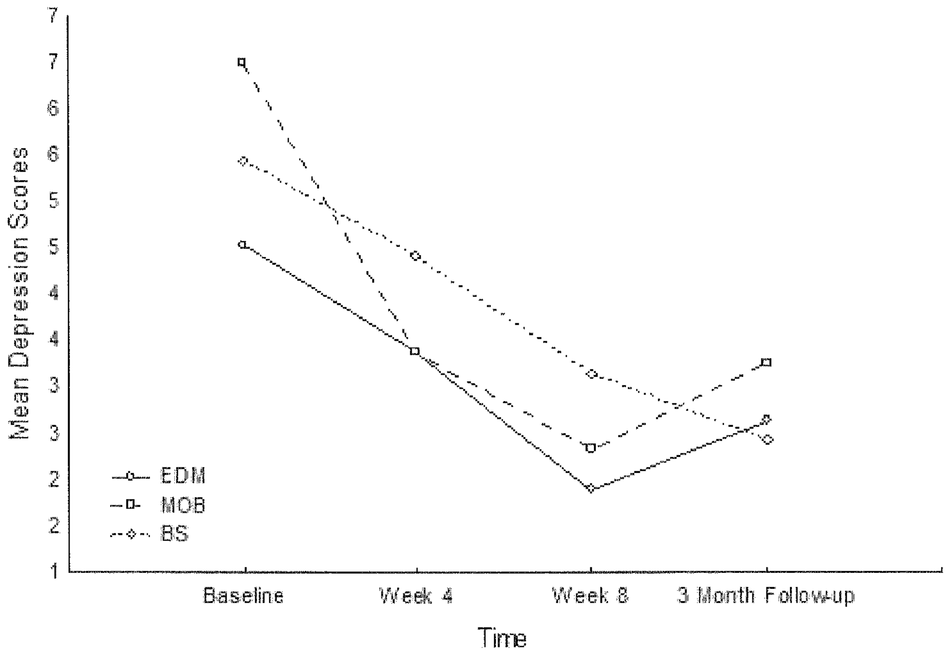


Figure 3. Repeated Measures ANOVA: Change Over Time for DERS



points at baseline and 8 weeks, baseline and 3 months, and 8 weeks and 3 months were investigated. These analyses, with a critical p of .038, revealed that, for stress

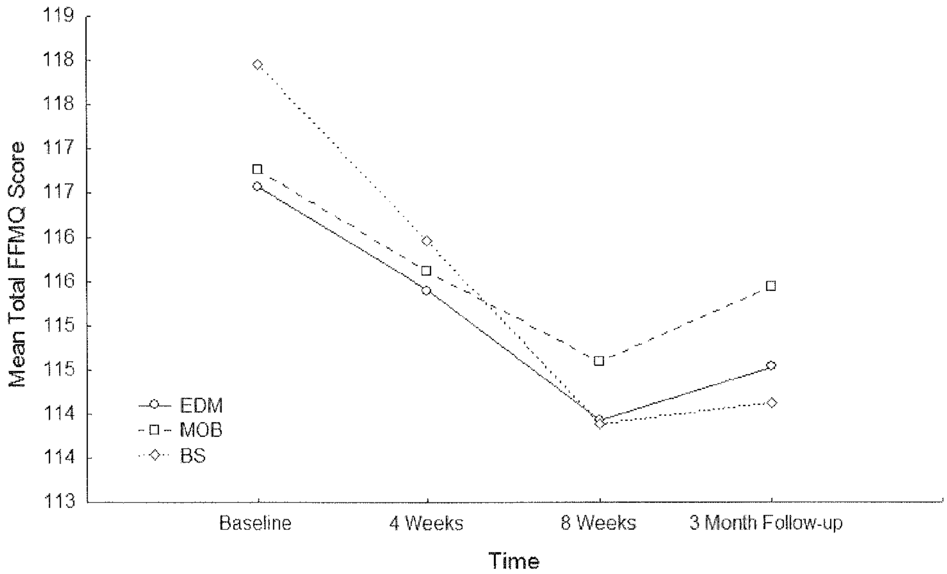
Figure 4. Repeated Measures ANOVA: Change Over Time for DASS Depression



scores, comparisons between baseline and 8 weeks, and between baseline and 3 months for all three groups were significant. However, the comparison between the 8-week and 3-month points was significant for the EDM group only. For this period between completion of the 8-week course and the 3-month follow-up, stress scores increased for MOB (g = 0.27) and EDM (g = 0.46) and decreased for BS (g = 0.20). For DERS scores, with a critical p of .033, comparisons between baseline and 8 weeks and between baseline and 3 months for all three groups were also significant. However no comparisons between the 8-week and 3-month points were significant. Between week 8 and the 3-month follow-up there were no significant differences in DERS mean scores for any of the groups, as can be seen in Figure 3, however effect sizes for the change scores over this period for the three groups were as follows: EDM, g = 0.02; MOB, g = .05; and BS, g = .27.

As expected, these ANOVAs revealed that scores for stress, anxiety, depression, and difficulties in emotion regulation decreased and scores for life satisfaction increased over the course of the 8-week programme (see significant main effects of time in Table 3). In contrast, the significant change over time revealed on the Five Factor Mindfulness Questionnaire reflects a change in the opposite direction to that which would be expected, with scores decreasing over the course of the 8-week programme (see Figure 5) (see Appendix W for statistical output for all of the above mentioned repeated measures ANOVAs).

Figure 5. Repeated Measures ANOVA: Change Over Time for Total Five-Factor Mindfulness Questionnaire



Hypothesis Two.

In order to assess hypotheses two and three, a set of *change scores* were calculated for each dependent variable. Change was calculated by subtracting participants' scores at baseline from their scores at the end of the 8-week course.

It was hypothesised that, for all groups, there would be a positive correlation between change in interoception over time and change on the dependent variable measures - anxiety, stress, depression, DERS, mindfulness, and life satisfaction - over time. To investigate this relationship, change scores for each dependent variable previously described (change over time from baseline to 8 weeks) were analysed for correlations with change scores derived from the interoception measure (interoception scores at baseline subtracted from interoception scores at 8 weeks). Looking across groups, this interoception change score correlated significantly and positively, although weakly, with the change score for life satisfaction, $r(98) = .21, p < .05$ and, contrary to that which would be expected, significantly negatively with the change score for mindfulness, $r(100) = -.22, p < .05$, though this correlation was weak (see Appendix X for statistical output).

Hypothesis Three.

It was predicted that there would be a positive correlation between improvements over time (scores reflecting change over time) for those in the MOB and BS groups and the amount of meditation practise completed at home. A similar procedure to that which was used to investigate Hypothesis 2 was used to investigate this hypothesis. Analyses investigated the extent to which these change scores correlated with a number of variables measuring at-home meditation practise, including: the total number of minutes practised at home throughout the duration of the 8-week course; the total number of at-home meditation sessions conducted throughout the duration of the course; the average number of minutes practised during each meditation session at home; and the total number of days on which meditation sessions were practised at home throughout the duration of the course. These correlations were calculated for those in the meditative MOB and BS groups separately and across both groups together. For those in the MOB group: there was a moderately significant positive correlation between change scores for stress and total number of minutes meditation was practised at home, $r(38) = .48, p < .05$; and there was a moderately significant positive correlation between change scores for stress and total number of days on which meditation was practised, $r(38) = .41, p < .05$. In addition, there were moderately significant positive correlations between change scores for anxiety and both total number of minutes meditation was practised at home, $r(38) = .44, p < .05$ and total number of days on which meditation was practised, $r(38) = .41, p < .05$. For those in the BS group there was a moderately significant positive correlation between change scores for anxiety and total number of minutes meditation was practised at home, $r(26) = .40, p < .05$. When the results for both meditation groups were pooled together there were no significant across group correlations with these practise variables (see Appendix Y for statistical output).

Supplementary Analyses

Additional exploratory analyses were conducted to assess whether there were differences in the amount of at-home practise completed by participants in the MOB and BS groups. One-way ANOVAs were used to compare the amount of at-home meditation practise (as measured by number of days practised for the week, number of minutes practised for the week, average number of minutes practised per session, and number of sessions practised for each week) completed by those in the two meditative conditions. Those in the BS group completed significantly more minutes of meditation at home throughout the duration of the 8-week course than those in the MOB group, $F(1, 66) = 4.086, p = .047, \eta^2_p = .06$. Those in the BS group also practised meditation on a significantly greater number of days than those in the MOB group, $F(1, 66) = 5.70, p = .020, \eta^2_p = .02$. There were no significant results in ANOVAs performed on the other practise variables (see Appendix Z).

Because these differences in amount of meditation completed and number of days on which meditation was completed were found, partial correlations were calculated to investigate whether there were any changes in the relationship between group and change over time on the dependent variables when controlling for these practise related variables. Correlations between group (MOB or BS) and change in scores between baseline and 8 weeks for stress, anxiety, depression, DERS, life satisfaction, and mindfulness indicated that there was a small correlation for stress only. That is, the score representing difference in reported stress from baseline to the completion of the 8-week course correlated significantly, though weakly, with group, $r(68) = .24, p < .05$. A partial correlation was then used to evaluate the same relationship, between change scores and group, while controlling for total number of minutes for which meditation was practised. This calculation indicated that there were no significant correlations between group and change over time (between baseline and 8 weeks) on any of the dependent variables. Similarly, the same partial correlations were analysed, while controlling for total number of days on which meditation was practised at home. Again, this analysis indicated no significant correlations (see Appendix X for statistical output for these correlations and partial correlations). This indicates that, although there were differences between stress outcomes for the MOB and BS groups, as was indicated in the ANOVA calculated for Hypothesis 1 looking at change in mean stress scores over the project's 4 time points, when the contribution of meditation practise is removed, these differences are no longer significant. Therefore, the results ANOVA from Hypothesis 1 looking at stress scores possibly reflect differences in adherence to meditation rather than actual differences between the two techniques.

The difference between the actual amount of meditation practised and the two daily 30-minute sessions that participants were asked to practise was also calculated. The average total number of minutes practised at home for all participants in the MOB and BS groups together was 2893 minutes, which is 86% of the 3360 minutes requested (two 30 minute sessions per day). Similarly, participants practised an overall average of 101 meditation sessions throughout the duration of the 8-week course, which is 90% of the 112 sessions requested.

One-way ANOVAs were used to investigate whether the mindfulness trainer's increased experience in teaching contributed to better quality teaching and better outcomes for participants in the second half of the study. Although the same trainer was used for all 8-week courses, half of these courses were conducted in 2010 and half were conducted the following year. As a result, the trainer, who was trained in mindfulness in the 12 months prior to commencement of the 2010 courses, had a greater level of mindfulness practise experience and mindfulness training experience by the time she conducted the 2011 courses. Despite this, analyses revealed no significant differences between the change scores on any of the dependent variables when results for participants from these two years were compared (see Appendix AA for statistical output).

Discussion

The current study was conducted to directly compare the impact of three different mindfulness techniques on measures of well-being and life satisfaction over time for a community sample. By comparing the effects of training in the practices of everyday mindfulness, mindfulness of breath, and body scanning this study has provided evidence that individuals who receive training in any of these techniques experience reductions in depression, anxiety, and stress, and increases in life satisfaction and emotion regulation. There are also some apparent differences in the outcomes between the three techniques. The lack of a control group, however, means that factors not specific to the mindfulness training such as attention from the trainer, the social aspect of attendance at a weekly group, or a placebo effect cannot be ruled out as contributing factors to these results.

All findings will be discussed in detail below as they relate to each of the hypotheses set out at the beginning of this thesis. Additional findings that arose from the study, as well as limitations and generalisability of the research, suggestions for future research, and conclusions reached will also be addressed.

Hypothesis One

It was hypothesised that participants in the mindfulness of breath (MOB) and body scanning (BS) groups, who were trained in formal meditative practices, would display better outcomes on all dependent variable measures compared to those in the everyday mindfulness (EDM) group, in which only informal non-meditative mindfulness practice was taught. It was further hypothesised that participants in the BS group would experience greater improvements over time than those in the MOB group. These hypotheses were not supported. While all three groups experienced significant change over time throughout the 8-week course on all dependent variables, interactions between group and time were only evident for difficulties in emotion regulation (DERS) and stress.

DASS Stress Scores.

During the period between the end of the 8-week training course and follow-up 3 months later, mean stress scores for those in the EDM group increased significantly and an effect size calculation indicated that this was a moderate effect, whereas there was no significant change in mean stress scores for those in the MOB and BS groups, where the effect sizes were small. These findings align with the researchers' expectations regarding the efficacy of the meditative techniques compared to the non-meditative approach. While all three groups experienced a reduction in mean stress scores over the course of the 8 weeks of training, this trend reversed significantly during the 3 months post-training for those in the non-meditative EDM group only. In addition to the lack of any marked differences between the trajectory of change over time for mean scores for those in the MOB, BS, and EDM groups over the course of the training program, this rebound effect of increased mean stress scores post-training for those in the EDM group is noteworthy.

The time dedicated to formal meditative practise when completing mindfulness of breath or body scanning training provides a regular opportunity to practise the cognitive skills and strengthen the neural pathways involved in mindfulness. It is likely that, compared to the practise of everyday mindfulness, formal meditation practise provides more intensive, and consequently more efficient training in skills like metacognitive insight, sustained attention, response inhibition, and response re-engagement; allowing participants to become more adept at disengaging from thoughts, controlling their attention, and being less reactive. A current lack of research into the difference between formal and informal mindfulness practices means there are presently no studies directly supporting this hypothesis, however, during meditation these cognitive skills are practised every time a thought arises or a sensation is felt, which occurs many times during each twice-daily 30-minute meditation session. Thus, meditation provides the opportunity for metacognitive insight, sustained attention, response inhibition, and response re-engagement to be practised repeatedly in a controlled environment. Conversely, when practising everyday mindfulness, one attempts to remember to observe thoughts, sensations, and external stimuli in an accepting and non-reactive mindful way throughout the day. Without formal meditation practise it can be difficult to remember to do this in daily life, which was anecdotally reported by those in the EDM group in this study. Also, it has been argued that structured daily meditation with its simple repetitive nature not only provides conditions that encourage the more rapid development of the outlined cognitive skills, but perhaps also fosters the structural neurological changes that have been linked to the benefits of mindfulness training which includes meditation (Davidson, et al., 2003, Goleman, 1976; Swartz, 1975).

In the present study it is possible that lasting structural neurological changes contributed to the better maintenance of reduced stress symptoms for participants in the MOB and BS groups, while reductions experienced by those in the EDM group were not maintained as effectively after the completion of the 8-week course. According to traditional cognitive-behavioural theory, maladaptive stress-inducing cognitive patterns and reactive habits are the driving component behind an over-reactive stress response (Beck, 1976; Beck, Emery, & Greenberg, 1985). Given this, it is not surprising that cultivation of the mindfulness skills mentioned during meditation reduced daily stress levels. Providing support for this theory, in the present study, participants practising formal meditative mindfulness techniques (during mindfulness of breath or body scanning) were able to maintain the benefits of reduced stress symptoms post-training to a greater extent than those practising everyday mindfulness.

It is also important to note that although changes in mean stress scores between completion of the training course and the 3-month follow-up for participants in the formal meditative groups were not significant, scores for those in the MOB group increased whereas scores for those in the BS group continued to decrease during this time. Both of these changes had small effect sizes. Thus, the BS group was the only group to experience a meaningful continued reduction of stress scores after the completion of the training course. It is likely that these post-training trends would have been significant had the group sample sizes been large. This pattern may provide evidence in support of the superior efficacy of the body scanning technique compared to the mindfulness of breath technique, which was predicted. Supplementary analyses did reveal, however, that those in the BS group completed significantly more at-home meditation practise and meditated on a significantly greater number of days than those in the MOB group while attending the 8-week course.

Partial correlations were calculated to investigate the impact of time spent meditating on this relationship between group and change in stress scores (see Appendix AB for statistical output). These analyses indicated that, although there is a relationship showing that there is a significant difference in change in stress scores over the period of the 8-week course when comparing the MOB and BS groups (as was also indicated by the ANOVA discussed above), when the contribution of meditation practise is removed, this difference is no longer significant. These analyses suggest that perhaps it was actually the difference in amount of meditation practise that existed between the MOB and BS groups that led to this significant interaction between groups when looking at change in mean scores over time. This means that the continued reduction in mean stress scores experienced by those in the BS group may actually be a reflection of this group's greater commitment to meditation practice at home. It is also possible, however, that there is something unique to the body scanning technique that leads to greater commitment to practise. For example, it is possible that more improved abilities in skills such as equanimity, non-reactivity, and response inhibition led to a higher level of discipline in these meditators, in a way that was not experienced by those in the MOB group. These skills may allow the meditator to more effectively inhibit automatic reactions to and let go of thoughts relating to excuses not to meditate.

Difficulties in Emotion Regulation Scores.

While the main effect of time for DERS scores indicates that all three groups experienced benefits over the course of the 8-week program, there were disparate trends between the three groups following the completion of the course. Although changes in mean DERS scores between the end of the training course and the 3-month follow-up were not significant, only participants in the BS group experienced a continuing decrease in reported difficulties in emotion regulation during this period. The effect size of this decrease was small and therefore likely to be meaningful. Conversely, participants in the MOB and EDM groups experienced a very minimal non-meaningful change in scores during this time. As with the trend noted in mean stress scores for this time period, it is possible that this decrease for the BS group may have reached significance had the sample size been larger. Again, the trend provides tentative support for the superiority of the body scanning technique compared to both other techniques in terms of emotion regulation outcomes, as was hypothesised in light of Cayoun's (2011) Co-emergence Model of emotion regulation. As has been discussed, findings indicating that those in the BS group completed more meditation practise than those in the MOB group may also have contributed to this result. Partial correlations indicated that controlling for variables related to meditation practise did not significantly affect the relationship between group and change over time for DERS scores, however. Thus, it seems that body scanning may have some benefits over mindfulness of breath and everyday mindfulness in terms of continuing reduction in difficulties in emotion regulation after the completion of a training course.

As has been discussed when addressing the results for stress scores, it is likely that, these continuing benefits in emotion regulation reflect the development of skills such as metacognitive insight, sustained attention, response inhibition, and response re-engagement which allow the meditator to disengage from thoughts, control their attention, and experience occurrences in their life in a less emotionally reactive way. It is also possible that the practice of body scanning led to the development of more stable and enduring structural changes in the brain compared to the practices of mindfulness of breath and everyday mindfulness, which in turn allowed these emotion regulation skills to be experienced for longer.

Anxiety, Depression, Life Satisfaction, and Mindfulness.

Participants in all treatment groups showed significant reductions over time for anxiety and depression, and significant increases over time for life satisfaction and mindfulness. Effect sizes were large in each case except for the medium effect on the mindfulness variable. It is unclear, however, exactly why there were differences in change over time between the groups for stress and difficulties in emotion regulation only, as well as the interaction effect for change over time between the groups for depression approaching significance. All three of these interactions had small to moderate effect sizes. It is likely that, if this study were to be replicated with a large sample size, greater differences on outcome measures, and in particular stress, difficulties in emotion regulation, and depression, would have emerged between the three training groups.

There are a number of possible explanations for why the effect of training group was different as a function of the dependent variable of interest. It is possible that DERS and stress, where significant differences in change over time are apparent, reflect constructs for which mindfulness training has a greater impact in the short- and medium-term. Perhaps symptoms of anxiety and depression, levels of life satisfaction, and mindfulness as measured by the FFMQ are not as easily influenced in a non-clinical sample by the types of training employed in the present study. It is also possible that the fact that those in the meditative groups completed a mean of only 86% of the total minutes of meditation practise requested may have impacted on these results. It is predicted that results would have been more robust had the recommended amount of meditation been completed. Given that previous studies have failed to measure the amount of meditation that participants practised at home, we cannot speculate with respect to whether the level of adherence to practise recorded in the current study is out of the ordinary.

Hypothesis Two

Bodily sensations, interoception, and "equanimity" or non-reactivity towards bodily sensations are fundamental to the theory presented in Cayoun's (2011) Co-emergence Model. Based on this model and the connection between bodily sensations and emotions, it was hypothesised that change in participants' interoceptive skills over time would correlate with change over time on dependent variables reflecting emotional well-being. This was only true for the life satisfaction variable: as awareness of bodily sensations increased, life satisfaction scores also increased. This result was only significant when analysing participants across the three groups, however, not when analysing any group individually. Thus, contrary to expectations, this correlation between change in life satisfaction and change in interoception was not significant when looking at the BS group on its own, despite the fact that this is the technique where bodily sensations and interoception are theoretically most integral. Given that there was a significant pattern of decreasing stress, anxiety, depression, difficulties in emotion regulation, and increasing in life satisfaction over time for all groups, it would seem that the lack of significant results for these correlations with change in interoception indicates that interoception is not a key functional component contributing to the benefits experienced by participants. This evidence counters the theoretical process proposed in Cayoun's 2011 model, which describes interoception as necessary for emotion regulation.

One explanation for this lack of relationship between interoception and psychological well-being is that, early on in mindfulness training perhaps it is other aspects besides interoception that are responsible for gains in participants' well-being and emotional stability. Perhaps awareness of bodily sensations and the ability to regard these with equanimity is a more advanced skill that arises and contributes to increasing emotional benefits after one has practised regularly for a longer period of time than 8 weeks, or which may arise sooner if enough at-home meditation is practised. This argument is supported by the evidence that many participants struggled to maintain regular daily practise and practised on average only 86% of the expected amount. Cayoun's co-emergence model and the role of interoception in mindfulness are however untested to date and need to be further investigated if the contribution of this potentially key functional component is to be assessed.

Hypothesis Three

Meditation practise is purported to be the primary functional component of mindfulness of breath and body scanning training. Thus, it was hypothesised that variables including the total number of minutes practised at home during training, the total number of at-home meditation sessions conducted while attending training, the average number of minutes practised during each at-home meditation session, and the total number of days on which at-home meditation was practised per week while attending the course would correlate with change over time on the dependent variables. Put simply, it was expected that more practise would lead to improved outcomes.

This hypothesis was partially supported. For those in the MOB group, change over time in stress scores significantly positively correlated with the total number of minutes for which meditation was practised at home and with the total number of days on which meditation was practised per week. For those in the MOB and BS groups, change scores for anxiety correlated with total number of minutes meditation was practised at home and, for those in both the MOB group only, with total number of days on which meditation was practised during the week.

These results suggest that number of minutes for which meditation was practised at home and number of days on which meditation was practised during the week throughout the duration of the 8-week mindfulness course directly translated to comparative reductions in stress and anxiety symptoms. The correlational nature of this data means that causality cannot be assumed; however, as predicted, it appears that increased time practising at home has a positive impact on individuals' stress and anxiety levels.

It is difficult to determine why the other practise variables - total number of meditation sessions conducted at home and average number of minutes practised during each meditation session - did not correlate with change over time on any of the dependent variables. One possibility is that those with high numbers of sessions practised at home were completing meditation sessions that were too short for the benefits of the practise to be experienced. In addition, perhaps those who scored highly on average number of minutes practised per session, the other variable for which correlations were not significant, did not have a regular practise and possibly practised for longer sessions less frequently than was necessary for benefits to be experienced. It is likely that those with a higher number of overall minutes practised and a higher number of days on which meditation was practised represented the participants who did form a regular daily practise as was instructed and that this was most conducive to reductions in stress and anxiety. Additional research is needed to investigate this further.

Additional Findings: Measuring Mindfulness

Mindfulness scores, as measured by the Five Factor Mindfulness Questionnaire (FFMQ), decreased significantly over the course of training for participants in all three groups. One explanation for this unexpected result is that the FFMQ is an accurate reflection of one's mindfulness skills and that the training used in the present study led to decreased mindfulness skills in participants. If this were the case, the positive outcomes yielded on the other dependant variables may have been due to non-specific factors (i.e., not related to mindfulness per se) such as attention from the trainer, the social support of the weekly group sessions, psychological benefits related to their involvement in a university study, or a placebo effect.

On the other hand, a different potential explanation for the unexpected finding that FFMQ scores decreased over time relates to recent discussions about the inaccuracy of mindfulness questionnaires and the difficulties faced by those attempting to measure this construct (e.g. Grossman, 2011; Grossman & Van Dam, 2011; Sauer et al., 2013; Van Dam, Earleywine, & Danoff-Burg, 2009). One of the issues discussed by Grossman (2011) is a trend where particular questions about mindfulness are interpreted differently by novices and experienced meditators. Based on what Grossman hypothesised can occur, perhaps participants in this study experienced an alteration in their interpretation of some FFMQ items as they learnt more about mindfulness and began to practise mindfulness regularly. Evidence to support these claims of varying interpretation can be found in studies by Van Dam, Earlywine, and Danoff-Burg (2009) and Grossman (2008) (for a detailed analysis of the range of issues contributing to the validity problems with these questionnaires refer to Bergomi, Tschacher, and Kup-per (2012) and Grossman (2011)).

Thinking about the items of the FFMQ provides further explanation for why more training in the technique may actually lead participants to feel that they are less knowledgeable about the practice. Many items on the FFMQ, like most mindfulness questionnaires, focus on one's "awareness", an important aspect of mindfulness that the training aims to enhance. It is likely that as a person enters into and begins practising mindfulness, one's awareness of his or her own *lack of* awareness increases (Sauer et al., 2013). This could also contribute to an individual's interpretation of particular items changing over time. For example, an individual's response to the item "I find myself doing things without paying attention" may be quite different once they begin to consciously and regularly pay attention, as they are trained to through mindfulness training, and realise how comparatively little they did so previously. Often it is not until one begins meditating and practising mindfulness that one realises how much of their time is spent caught up in thoughts and unaware of the subtleties of daily experience (Kabat-Zinn, 1990, 2005). Given this thinking, it is argued that an increase in participants' awareness of their lack of awareness coupled with possible changes in the way participants' interpreted many items as their training progressed directly contributed to the steady decline that was observed in participants' FFMQ scores over time. In this way, the results on the FFMQ yielded in this study highlight the many potential issues surrounding the use of these types of self-report questionnaires to measure mindfulness.

Study Limitations and Generalisability

There were three main limitations of this study. The first of these concerns its sample size. The large number of participants who did not complete the full 8-week course and who were not available at the 3-month follow-up contributed to a smaller sample size in each group than was initially projected. This also raises the question of whether the loss-to-follow-up problem may have impacted our data, despite the fact that analyses indicated no significant differences between those who discontinued compared to those who completed the training in terms of age group, gender, education level, marital status, current work status, income, and previous or current mental illness diagnosis. It is possible that the data was biased as due to participants who were benefiting most from the training remaining in the study while participants who were not benefiting as much discontinued. Secondly, participants' poor adherence to at-home meditation practise is likely to have impacted the robustness of the findings of this study. It is unclear whether there was a lack of motivation to meditate because this was a non-clinical sample, whether there were other issues contributing to lacking adherence to homework, or whether this level of commitment to meditation practise is the norm for people practising mindfulness meditation. Regardless of the reason, it is argued that greater differences between the three groups would have emerged and correlations between practise variables and dependent variable scores may have been stronger had the recommended amount of meditation been completed by more participants. Finally, the lack of a control group means that the extent to which non-specific factors (i.e., those not directly related to mindfulness training) such as attention from the trainer, social support in the weekly group sessions, and psychological benefits related to involvement in a university study contributed to the benefits experienced by the participants in this study cannot be assessed.

Suggestions for Future Research

While this study provides some evidence for the efficacy of the meditative techniques over the practice of everyday mindfulness in terms of reduced stress and benefits for emotion regulation, these differentiating effects were arguably minor. Future research is encouraged to further investigate the functional components of body scanning, mindfulness of breath, and everyday mindfulness as well as the difference in outcomes that can occur when practicing one of these techniques compared to another. To further test the hypotheses that were set out in this study, similar research should be conducted using larger sample sizes and a control group to assist in discerning the relative contribution of non-specific factors and factors specifically related to the mindfulness training. Furthermore, intention-to-treat analyses that take into account the data of the participants who discontinued prior to completion of their course would address the loss-to-follow-up issue. In order to further assess the generalisability of these findings it will also be important to conduct similar research using clinical populations. Further, to aid investigation into the differential functional components of current mindfulness techniques, the role that structural brain changes play in relation to the psychological gains experienced should be explored through neuropsychological research. Finally, the significant correlations between overall number of minutes practised, overall number of days on which meditation was practised, and the outcomes for stress and anxiety could be investigated using experimental research that manipulates participants' meditation schedules. For example, research comparing the difference in outcomes between regular and sporadic meditation sessions as well as between longer and shorter meditation sessions would be an important contribution to the field.

Conclusion

Aligning with an abundance of existing evidence, this research project provides evidence in support of the benefits of an 8-week course of mindfulness training for a non-clinical population. We saw positive effects of this course on life satisfaction, emotion regulation, and symptoms of stress, anxiety, and depression. By comparing the effects of training in everyday mindfulness, mindfulness of breath, and body scanning this study provides evidence that individuals who are trained in the formal meditative practices of mindfulness of breath or body scanning report decreased levels of stress that are better maintained post-completion of the training compared to those trained in the informal practice of mindfulness. There also appears to be a trend where stress continues to decrease after the completion of an 8-week mindfulness training course for those trained in body scanning techniques, unlike those trained in mindfulness of breath or everyday mindfulness techniques. However, controlling for amount of meditation practice completed at home indicated that this may be a reflection of the body scanning group's greater commitment to at-home meditation practise compared to those in the mindfulness of breath group. Further, in regards to reductions in difficulties in emotion regulation, there was a trend indicating the increased efficacy of body scanning training compared to mindfulness of breath training. This was evident in the reductions in difficulties in emotion regulation that continued to decrease after the completion of the training course for those in the body scanning group only. Correlations between time spent meditating and measures of well-being also indicated that, for those receiving training in mindfulness of breath or body scanning, there is a relationship between more time spent meditating and greater reductions in stress and anxiety. To further aid clinicians in providing the most effective mindfulness-based treatment for clients, suggestions have been made to further investigate the comparative efficacy of these three commonly used mindfulness techniques in terms of outcomes for psychological well-being.

References

Allen, N. B., Chambers, R., Knight, W., Blashki, G., Ciechomski, L., Hassed, C., . . . Meadows, G. (2006). Mindfulness-based psychotherapies: A review of conceptual and practical considerations foundations, empirical evidence. *Australian and New Zealand Journal of Psychiatry, 40,* 285–294. doi:10.1111/J.1440-1614.2006.01794.X

Antony, M. M., Bieling, P. J., Cox, B. J., Enns, M. W., & Swinson, R. P. (1998). Psychometric properties of the 42-item and 21-item versions of the Depression Anxiety Stress Scales (DASS) in clinical groups and a community sample. *Psychological Assessment, 10,* 176-181. doi:10.1037/1040-3590.10.2.176

Archa, J. J., & Craskea, M. G. (2006). Mechanisms of mindfulness: Emotion regulation following a focused breathing induction. *Behaviour Research and Therapy, 44,* 1849–1858. doi:10.1016/J.Brat.2005.12.007

Astin, J. (1997). Stress reduction through mindfulness meditation: Effects on psychological experiences. *Psychotherapy and Psychosomatics, 66,* 97-106. doi:10.1159/000289116

Baer, R.A., Smith, G.T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness, *Assessment,13,* 27-45. doi:10.1177/1073191105283504

Beck, A.T. (1976). *Cognitive therapy and the emotional disorders.* New York, USA: International Universities Press.

Beck, A.T., & Emery, G. (1985). *Anxiety disorders and phobias: A cognitive perspective.* New York, USA: Basic Books.

Benjamini, Y. (2010). Discovering the false discovery rate. *Journal of the Royal Statistical Society: Series B (Statistical Methodology), 72,* 405–416. doi:10.1111/J.1467-9868.2010.00746.X

Benjamini, Y., & Hochberg, Y. (1995). Controlling the false discovery rate: A practical and powerful approach to multiple testing. *Journal of the Royal Statistical Society: Series B (Methodological), 57*(1), 289–300.

Bergomi, C., Tschacher, W., and Kupper, Z. (2012). The assessment of mindfulness with self-report measures: Existing scales and open issues. Mindfulness. doi: 10.1007/s12671- 012-0110-9

Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology, 84,* 822 – 848. doi:10.1037/0022-3514.84.4.822

Buchheld, N., Grossman, P., & Walach, H. (2001). Measuring mindfulness in insight meditation (vipassana) and meditation-based psychotherapy: The development of the Freiburg Mindfulness Inventory (FMI). *Journal of Meditation and Meditation Research, 1,* 11-34.

Cayoun, B. A. (2003a). *Mindfulness Training: Stage 1* [CD]. Hobart: MICBT Institute.

Cayoun, B. A. (2003b). *Mindfulness Training: Stage 2* [CD]. Hobart: MICBT Institute.

Cayoun, B.A. (2011). *Mindfulness-Integrated CBT: Principles and practice*. UK: John Wiley and Sons, Ltd.

Chiesa, A. & Serretti, A. (2011). Mindfulness based cognitive therapy for psychiatric disorders: A systematic review and meta-analysis. *Psychiatry Research, 187,* 441-453. doi:http://dx.doi.org/10.1016/j.psychres.2010.08.011

Curran-Everett, D. (2000). Multiple comparisons: Philosophies and illustrations, *American Journal of Physiology - Regulatory Integrative and Comparative Physiology*, 279, R1-R8

Davidson, R. J. (2010). Empirical explorations of mindfulness: Conceptual and methodological conundrums. *Emotion, 10*, 8–11. doi:10.1037/A0018480

Davidson, R. J., Kabat-Zinn, J., Schumacher, J., Rosenkrantz, M., Muller, D., Santorelli, S. F., . . . Sheridan, J. F. (2003). Alterations in brain and immune function produced by mindfulness meditation. *Psychosomatic Medicine, 65,* 564-570. doi:10.1097/01.Psy.0000077505.67574.E3

Davidson, R. J., Kabat-Zinn, J., Schumacher, J., Rosenkrantz, M., Muller, D., Santorelli, S. F., . . . Sheridan, J. F. (2003). Alterations in brain and immune function produced by mindfulness meditation. *Psychosomatic Medicine, 65,* 564-570. doi:10.1097/01.Psy.0000077505.67574.E3

Deckersbach, T., Hölzel, B. K., Eisner, L. R., Stange, J. P., Peckham, A. D., Dougherty, D. D., . . . Nierenberg, A. A. (2012). Mindfulness-Based Cognitive Therapy for nonremitted patients with bipolar disorder. *CNS Neuroscience & Therapeutics, 18,* 133-141. doi:10.1111/J.1755-5949.2011.00236.X

Diener, E., Emmons, R.A., Larson, R.J., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment, 49,* 71-76. doi:10.1207/S15327752jpa4901_13

Eberth, J., & Sedlmeier, P. (2012), The effects of mindfulness meditation: A meta-analysis. *Mindfulness, 3*, 174-189. doi:10.1007/S12671-012-0101-X

Farb, N. A, Anderson, A. K., Mayberg, H., Bean, J., Mckeon, D., & Segal, Z. V. (2010). Minding one's emotions: Mindfulness training alters the neural expression of sadness. *Emotion, 10*, 25-33. doi:10.1037/A0017151.

Farb, N. A. S., Segal, Z. V., Mayberg, H., Bean, J., Mckeon, D., Fatima, Z., & Anderson, A. K. (2007). Attending to the present: Mindfulness meditation reveals distinct neural modes of self-reference. *Social Cognitive and Affective Neuroscience*. doi:10.1093/Scan/Nsm030.

Fernandez, A. C., Wood, M. D., Stein, L. A. R., & Rossi, J. S. (2010). Measuring mindfulness and examining its relationship with alcohol use and negative consequences. *Psychology of Addictive Behaviors, 24,* 608-616. doi:10.1037/A0021742

Frewen, P. A., Evans, E. M., Maraj, N., Dozois, D. J.A., & Partridge, K. (2008). Letting go: Mindfulness and negative automatic thinking, *Cognitive Therapy & Research, 32*, 758–774. doi:10.1007/S10608-007-9142-1Goenka, S. N. (1990). *Why vedana and what is vedana*? Maharashtra, India: Vipassana Research Institute. Retrieved from http://www.vridhamma.org/why-vedana-and-what-is-vedana

Goldin, P. R., & Gross, J. J. (2010). Effects of Mindfulness-Based Stress Reduction (MBSR) on emotion regulation in social anxiety disorder. *Emotion, 10*, 83-91. doi:10.1037/A0018441

Goleman, D. (1976). Meditation and consciousness: An Asian approach to mental health. *American Journal of Psychotherapy, 30*(1), 41-54.

Gratz, K. L., & Gunderson, J. G. (2006). Preliminary data on an acceptance-based emotion regulation group intervention for deliberate self-harm among women with borderline personality disorder. *Behavior Therapy, 37,* 25–35. doi:10.1016/j.beth.2005.03.002

Gratz, K. L., & Roemer, L. (2004) multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the Difficulties in Emotion Regulation Scale. *Journal of Psychopathology and*

Behavioral Assessment, 26, 41-54. doi:10.1023/B:Joba.0000007455.08539.94

Gratz, K. L., Lacroce, D., & Gunderson, J. G. (2006). Measuring changes in symptoms relevant to borderline personality disorder following short-term treatment across partial hospital and intensive outpatient levels of care. *Journal of Psychiatric Practice, 12,* 153–159. doi:10.1097/00131746-200605000-00004

Gratz, K. L., Rosenthal, M. Z., Tull, M. T., Lejuez, C. W., & Gunderson, J. G. (2006). An experimental investigation of emotion dysregulation in borderline personality disorder. *Journal of Abnormal Psychology, 115,* 850-855. doi:10.1037/0021-843X.115.4.850

Grossman, P. (2008). On measuring mindfulness in psychosomatic and psychological research. *Journal of Psychosomatic Research, 64,* 405-8. doi:10.1016/J.Jpsychores.2008.02.001

Grossman, P. (2011). Defining mindfulness by how poorly I think I pay attention during everyday awareness and other intractable problems for psychology's (re)invention of mindfulness: Comment on Brown et al. (2011). *Psychological Assessment, 23*, 1034-1040. doi:10.1037/A0022713

Grossman, P., & Van Dam, N. (2011). Mindfulness, by any other name...: Trials and tribulations of sati in western psychology and science. *Contemporary Buddhism, 12,* 219-239. doi:10.1080/14639947.2011.564841

Gunaratana, H. (2005). *Mindfulness in Plain English*. Somerville, USA: Wisdom Publications.

Harris, R. (2007). *The happiness trap: Stop struggling, start living*. Wollombi, Australia: Exisle Publishing Limited.

Hart, W. (1987). *The art of living: Vipassana meditation as taught by S.N. Goenka*. San Francisco, USA: Harper & Row.

Hayes, S. C., & Wilson, K. G. (2003). Mindfulness: Method and process. *Clinical Psychology: Science and Practice, 10,* 161-165. doi:10.1093/Clipsy.Bpg018

Hayes, S. C., Follette, V. M., & Linehan, M. M. (Eds.). (2004). *Mindfulness and acceptance: expanding the cognitive-behavioral tradition.* New York, USA: Guilford Press.

Hayes, S. C., Strosahl, K., & Wilson, K. G. (1999). *Acceptance and Commitment Therapy.* New York: Guilford Press.

Hayes, S. C., Wilson, K. G., Gifford, E. V., Follette, V. M., & Strosahl, K.K. (1996). Experiential avoidance and behavioral disorders: A functional dimensional approach to diagnosis and treatment. *Journal of Consulting and Clinical Psychology, 64,* 1152-1168. doi:10.1037/0022-006x.64.6.1152

Henry, J. D., & Crawford, J. R. (2005). The short-form version of the Depression Anxiety Stress Scales (DASS-21): Construct validity and normative data in a large non-clinical sample. *British Journal of Clinical Psychology, 44,* 227–239. doi:10.1348/014466505X29657

Jazaieri, H., Goldin, P. R., Werner, K., Ziv, M., & Gross, J. J. (2012). A randomized trial of MBSR versus aerobic exercise for social anxiety disorder. *Journal of Clinical Psychology, 68,* 715-731. doi:10.1002/Jclp.21863

Jha, A. P., Stanley, E. A., Kiyonaga, A., Wong, L., & Gelfand, L. (2010). Examining the protective effects of mindfulness training on working memory capacity and affective experience. *Emotion, 10*, 54-64. doi:10.1037/A0018438

Kabat-Zinn, J. (1982). An outpatient program in behavioural medicine for chronic pain patients based on the practice of mindfulness meditation: Theoretical considerations and preliminary results. *General Hospital Psychiatry, 4*(1), 33-47.

Kabat-Zinn, J. (2005). *Coming to our senses: Healing ourselves and the world through mindfulness*. London, England: Piatkus.

Kabat-Zinn, J., Lipworth, L., & Burney, R. (1985). The clinical use of mindfulness meditation for the self-regulation of chronic pain. *Journal of Behavioral Medicine, 8*(2), 163-190.

Kabat-Zinn, J., Massion, A. O., Hebert, J. R., & Rosenbaum, E. (1998). Meditation. In J. Holland (Ed.), *Textbook of psycho-oncology* (pp. 767-779). Oxford, England: Oxford University Press.

Kabat-Zinn, J., Massion, A., Kristeller, J., Peterson, L., Fletcher, K. E., Pbert, L., . . . Santorelli, S. F. (1992). Effectiveness of a Meditation-Based Stress Reduction programme in the treatment of anxiety disorders. *American Journal of Psychiatry, 149*(7), 936-943.

Kelly, M. M., Latta, R. E., & Gimmestad, K. (2012). Acceptance and mindfulness-based tobacco cessation interventions for individuals with mental health disorders. *Journal of Dual Diagnosis, 8,* 89-98. doi:10.1080/15504263.2012.670846

Khoury, B., Lecomte, T., Fortin, G., Masse, M., Therien, P., Bouchard, V., Chapleau, M., Paquin, K., & Hofmann, S.G. (2013). Mindfulness-based therapy: A comprehensive meta-analysis. *Clinical Psychology Review, 33,* 763-771. doi:http://dx.doi.org/10.1016/j.cpr.2013.05.005

Kingston, T., Dooley, B., Bates, A., Lawlor, E., & Malone, K. (2007). Mindfulness-Based Cognitive Therapy for residual depressive symptoms. *Psychology and Psychotherapy, 80*, 193–203. doi:10.1348/147608306x116016

Kirk, U., Downar, J., & Montague, P. R. (2011) Interoception drives increased rational decision-making in meditators playing the ultimatum game. *Frontiers Neuroscience, 5*(49). doi:10.3389/ Fnins.2011.00049. Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3082218/

Klainin-Yobas, P., Cho, M.A., & Creedy, D. (2012). Efficacy of mindfulness-based interventions on depressive symptoms among people with mental disorders: A meta-analysis. *International Journal of Nursing Studies, 49,* 109-121. doi:http://dx.doi.org/10.1016/j.ijnurstu.2011.08.014

Kristeller, J. L., & Hallett C. B. (1999). An exploratory study of a meditation based intervention for binge eating disorder. *Journal of Health Psychology, 4*(3), 357–363.

Langer, E. J. (1989). *Mindfulness*. New-York, USA: Addison-Wesley.

Langer, E. J. (1992). Matters of mind: Mindfulness/mindlessness in perspective. *Consciousness and Cognition, 1,* 289-305. doi:10.1016/1053-8100(92)90066-J

Lazar, S. W., Kerr, C. E., Wasserman, R. H., Gray, J. R., Greve, D. N., Treadway, M. T., . . . Fischl, B. (2005). Meditation experience is associated with increased cortical thickness. *Neuroreport, 16*(17), 1893-1897.

Leigh, J., Bowen, S., & Marlatt, G. (2005). Spirituality, mindfulness and substance abuse. *Addictive Behaviors, 30,* 1335-1341. doi:10.1016/J.Addbeh.2005.01.010

Lindsay, M. (2007). *Mindfulness-Integrated Cognitive Behaviour Therapy: A pilot programme for developing mindfulness-based self-efficacy and self-compassion* *for people with type 2 diabetes mellitus* (Unpublished master's thesis). University Of Auckland, New Zealand.

Linehan, M. (1993). *Cognitive-behavioral treatment of borderline personality disorder*. New York, USA: Guilford Press.

Lovibond, S. H., & Lovibond, P. F. (1995). *Manual for the Depression Anxiety Stress Scales* (2nd ed.). Sydney, Australia: Psychology Foundation.

Luders, E., Toga, A. W., Lepore, N., & Gaser, C. (2009). The underlying anatomical correlates of long-term meditation: Larger hippocampal and frontal volumes of gray matter. *Neuroimage, 45,* 672-678. doi:10.1016/J.Neuroimage.2008.12.061

Ma, S. H., & Teasdale, J. D. (2004). Mindfulness-Based Cognitive Therapy for depression: Replication and exploration of differential relapse prevention effects. *Journal of Consulting and Clinical Psychology, 72,* 31– 40. doi:10.1037/0022-006x.72.1.31

Margolis, J., & Langer, E. (1990). An analysis of addictions from a mindful/mindless perspective. *Psychology of Addictive Behavior, 4*(2), 107-115.

McMarney, R., Schulz, J., & Grey, A. (2012). Effectiveness of mindfulness-based therapies in reducing symptoms of depression: A meta-analysis. *European Journal of Psychotherapy and Counselling, 14*(3), 279-299.

Narada, M. (1968). *A manual of abhidhamma.* Kandy, Sri Lanka: Buddhist Publication Society.

Niles, B. L., Klunk-Gillis, J., Ryngala, D. J., Silberbogen, A. K., Paysnick, A., & Wolf, E. J. (2012). Comparing mindfulness and psychoeducation treatments for combat-related PTSD using a telehealth approach. *Psychological Trauma: Theory, Research, Practice, and Policy, 4,* 538-547. doi:10.1037/A0026161

Posner, M. I., & Raichle, M. E. (1997). *Images of mind.* New York, USA: Scientific American Library.

Ramel, W., Goldin, P. R., Carmona, P. E., & Mcquaid, J. R. (2004). The effects of mindfulness meditation on cognitive processes and affect in patients with past depression. *Cognitive Therapy and Research, 28,* 433-455. doi:10.1023/B:Cotr.0000045557.15923.96

Reibel, D. K., Greeson, J. M., Brainard, G. C., & Rosenzweig, S. (2001). Mindfulness-Based Stress Reduction and health-related quality of life in a heterogeneous patient population. *General Hospital Psychiatry, 23*(4), 183-92.

Roemer, L., & Orsillo, S. M. (2002). Expanding our conceptualization of and treatment for generalized anxiety disorder: Integrating mindfulness/acceptance-based approaches with existing cognitive-behavioural models. *Clinical Psychology: Science and Practice, 9,* 54-68. doi:10.1093/Clipsy.9.1.54

Sauer, S., Walach, H., Schmidt, S., Hinterberger, T., Lynch, S., Büssing, A., & Kohls, N. (2013). Assessment of mindfulness: Review on state of the art. *Mindfulness, 4*(1), 3-17. doi: http://dx.doi.org/10.1007/s12671-012-0122-5

Schwartz, G. (1975). Biofeedback, self-regulation, and the patterning of physiological processes. *American Scientist, 63*(3), 314-324.

Segal, Z. V., Williams, J. M. G., & Teasdale, J. D. (2002). *Mindfulness-Based Cognitive Therapy for depression: A new approach to preventing relapse.* New York: Guilford Press.

Shapiro, S. L., Schwartz, G. E., & Bonner, G. (1998). Effects of mindfulness-based stress reduction on medical and premedical students. *Journal of Behavioral Medicine, 21*(6), 581-599.

Speca, M., Carlson, L., Goodey, E., & Angen, M. (2000). A randomized wait-list controlled trial: The effects of a mindfulness meditation based stress reduction program on mood and symptoms of stress in cancer outpatients. *Psychosomatic Medicine, 62*(5), 613–622.

Tang, Y., Ma, Y., Wang, J., Fan, Y., Feng, S., Lu, Q., . . . Posner, M. I. (2007). Short-term meditation training improves attention and self-regulation. *PNAS Proceedings of the National Academy of Sciences of the United States of America, 104*, 17152-17156. doi:10.1073/Pnas.0707678104

Teasdale, J. D. (1999). Metacognition, mindfulness, and the modification of mood disorders. *Clinical Psychology and Psychotherapy, 6,* 146-155. doi:10.1002/(Sici)1099-0879(199905)6:2<146::Aid-Cpp195>3.0.Co;2-E

Teasdale, J. D., Moore, R. G., Hayhurst, H., Pope, M., & Williams, S., & Segal, Z. V. (2002). Metacognitive awareness and prevention of relapse in depression: Empirical evidence. *Journal of Consulting And Clinical Psychology, 70,* 275-287. doi:10.1037/0022-006x.70.2.275

Teasdale, J. D., Segal, Z. V., Williams, J. M. G., Ridgeway, V. A., Soulsby, J. M., & Lau, M. A. (2000). Prevention of relapse/recurrence in major depression by Mindfulness-Based Cognitive Therapy. *Journal of Consulting and Clinical Psychology, 68,* 615-623. doi:10.1037//0022-006x.68.4.615

Tolle, E. (1999). *The power of now: A guide to spiritual enlightenment.* Novato, USA: New World Library.

Van Aalderen, J. R., Donders, A. R. T., Giommi, F., Spinhoven, P., Barendregt, H. P., & Speckens, A. E. (2012). The efficacy of Mindfulness-Based Cognitive Therapy in recurrent depressed patients with and without a current depressive episode: A randomized controlled trial. *Psychological Medicine, 42,* 989-1001. doi:10.1017/S0033291711002054

Van Dam, N. T., Earleywine, M., & Danoff-Burg, S. (2009). Differential item function across meditators and non-meditators on the Five Facet Mindfulness Questionnaire. *Personality and Individual Differences,* 47, 516–521. doi:10.1016/J.Paid.2009.05.005

Vipassana Research Institute. (1990). *The importance of vedana and sampajanna.* Retrieved from http://www.vridhamma.org/vedana-and-sampajanna-its-importance

Wanden-Berghe, R.G., Sanz-Valero, J., & Wanden-Berghe, C. (2011). The application of mindfulness to eating disorders treatment: A systematic review. *Eating Disorders: The Journal of Treatment & Prevention, 19,* 34-48. doi: http://dx.doi.org/10.1080/10640266.2011.533604

Way, B. M., Creswell, J. D., Eisenberger, N. I., & Lieberman, M. D. (2010). Dispositional mindfulness and depressive symptomatology: Correlations with limbic and self-referential neural activity during rest. *Emotion, 10*, 12-24. doi:10.1037/A0018312.

Wells, A. (2002). Gad, metacognition, and mindfulness: An information processing analysis. *Clinical Psychology: Science and Practice, 9*, 95-100. doi:10.1093/Clipsy/9.1.95

Williams, K. A., Kolar, M. M., Reger, B. E., & Pearson, J. C. (2001). Evaluation of a wellness-based mindfulness stress reduction intervention: A controlled trial. *American Journal of Health Promotion, 15,* 422-432. doi:10.4278/0890-1171-15.6.422

Witkiewitz, K., & Marlatt G. A. (2006). Mindfulness-Based Relapse Prevention for alcohol and substance use disorders: The meditative tortoise wins the race. *Journal of Cognitive Psychotherapy, 19(3),* 221–228.

Witkiewitz, K., Marlatt, G., & Walker, D. (2005). Mindfulness-Based Relapse Prevention for alcohol and substance use disorders. *Journal of Cognitive Psychotherapy, 19(3),* 211-228.

Appendices

Appendix A: Summary of Cayoun's (2011) Co-Emergence Model

The Co-emergence Model.

Cayoun's (2011) co-emergence model of reinforcement is a model of embodied cognition that extends our understanding of learning principles through an analysis of the actual experience of reinforcement mechanisms. The model is anchored in modern Learning Theory and the phenomenology of mindfulness meditation and principles, and operationalised in a cognitive-behavioural framework.

The non-pathological functioning of the overall information system necessary for the reinforcement of learned behaviour is presented in Figure 1. An internally- or externally-generated stimulus (Stimulus) is perceived by the senses (Sensory Perception) in the form of smell, sight, touch, taste and sound, body sensation, or thought emerging from memory, and converted to a cognitive process of evaluation (Evaluation). This evaluation, a fundamental component of cognitive-behavioural theory, appraises perceived information according to one's judgement, uniquely affected schemas, values, personality, culture, needs, autobiographic memories and other filters, in order to make sense of the situation. It can be conscious or subconscious and learned ("automatic").

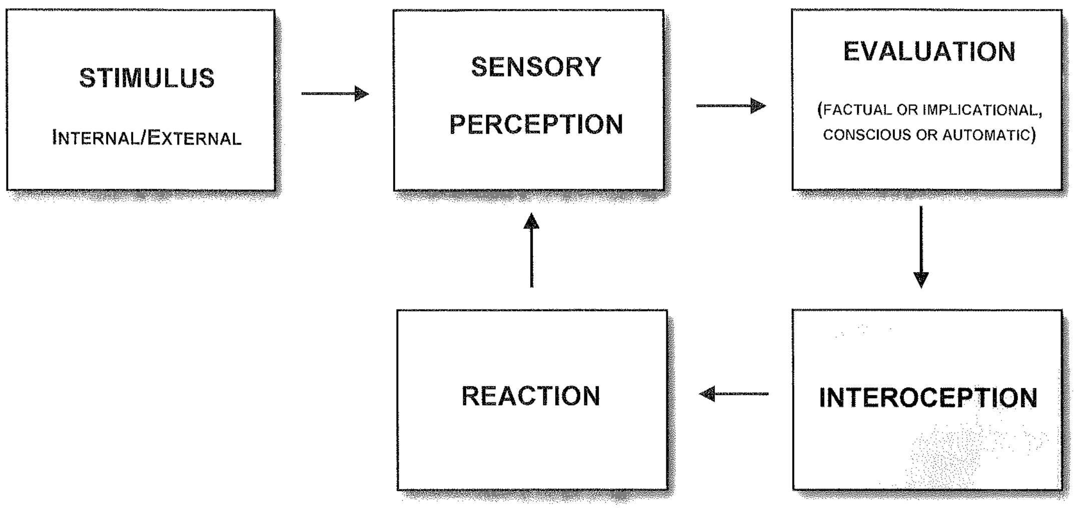


Figure 1. Components in the co-emergence model of reinforcement (From Cayoun, 2011).

Cayoun's model reflects the idea that the more implicational (personally relevant) a thought, the more spontaneous interoceptive changes co-emerge and are experienced consciously or subconsciously as sensations in the body (Interoception). This is because information judged as more important, such as the expectation of threats, creates deeper brain processing that sends greater feedback to somatosensory pathways. Therefore the more implicational a thought is, the more intense is the co-emerging body sensation, whether pleasant or unpleasant.

One of the differentiating factors of this model is its assertion that Reaction, the next component, is a direct response to Interoception, not to the stimulus or to the judgement. Accordingly, the extent to which body sensations are intense, is the extent to which we can predict a reaction, conscious or subconscious, expressed or unexpressed. Moreover, the extent to which sensations are pleasant is the extent to which reaction will be an attempt to increase both the duration and frequency of the sensation, and the extent to which the sensation is unpleasant, to that extent the reaction will be an attempt to decrease both the duration and frequency of the sensation. Therefore craving behaviour is positively reinforced each time a pleasant body sensation is successfully maintained or increased and aversive behaviour is negatively reinforced each time an unpleasant body sensation is successfully decreased, typically through avoidant behaviour.

Cayoun (2011) presents the notion that when we experience mental turmoil or emotional distress, a state of attentional disequilibrium between these four information-processing components takes place. Our attention is depleted from our senses (Sensory Perception and Interoception), and is reallocated to making judgement and reacting (Evaluation and Reaction). Figure 2 represents a state of disequilibrium in the attention system, pictorially highlighted by the disproportionate size of boxes representing each stage of the model. A stress response, for example, typically results in such disequilibrium. While the central nervous system is able to cope with a discrete stress response and generally recovers well from it, a disequilibrium state in the attention system can be learned and can become the most habitual state of the system, resulting in a continual cycle of negativity and emotional reactivity. We become over judgemental and over-reactive (as shown in Figure 2), facilitating the emergence and/or maintenance of psychopathology.

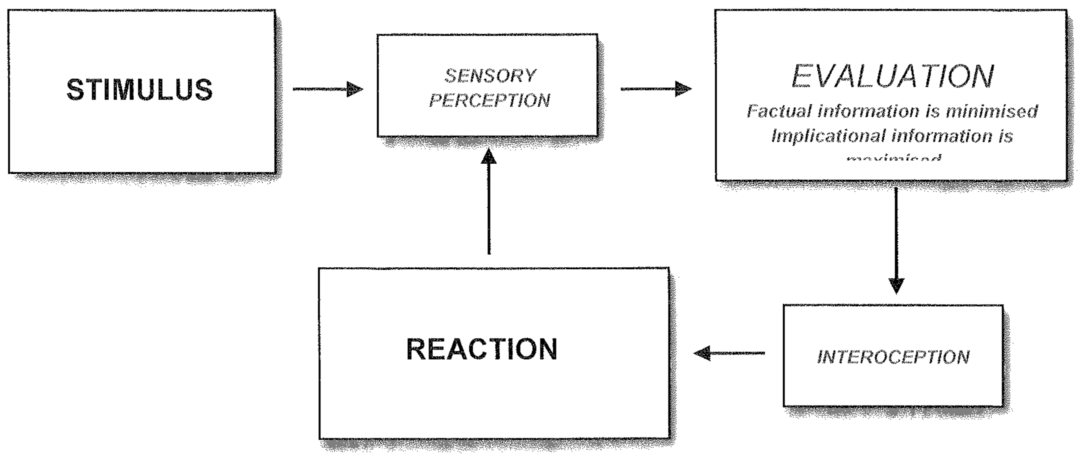


Figure 2. The co-emergence model of reinforcement during disequilibrium in information processing.

Cayoun (2011) argues that a fundamental part of the perpetuation of such psychopathology is our reactivity to body sensations. He also purports that, by shifting attention away from the judgemental and reactive parts of this system, and reallocating attention to sensory perception, through the practice of body scanning, a meditators system can be returned to equilibrium and old schemas and reactive habits can be altered.

Appendix B: Newspaper Advertisement

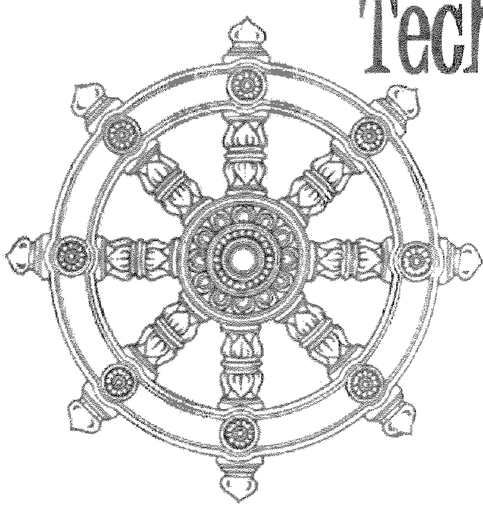
"Wanting to decrease stress and get more out of life using the power of your mind? We offer FREE training in mindfulness meditation as part of a psychological research project at the University of Tasmania. For further information please call Marise on 0422 635 009 or email mlfallon@utas.edu.au."

This article has been removed for copyright or proprietary reasons.

Volunteers relax into peaceful study, The Mercury, Tuesday 8 March 2011

Appendix D: Poster (Printed in A4 on UTAS Letterhead)

Interested in Training in Ancient Eastern Mindfulness Techniques?



A study being conducted within the School of Psychology at UTAS needs participants. All eligible participants will be provided with free training in eastern mindfulness techniques using methods based on the ancient techniques that have been used in Theravada Buddhism for centuries.

Previous research has shown these methods to:

- Reduce anxiety
- Increase positivity
- Increase working memory capacity
- Assist with pain management
- Reduce depression and sadness
- Increase self-control

There is no financial cost involved. We just need your time and your commitment to regular practice. Your involvement in this study will assist with attempts to more effectively integrate these ancient practices into psychological services and could help many people as a result.

For information please contact Marise at mlfallon@utas.edu.au or on 0410 388 648

Appendix E: Assessment Interview

Assessment Interview

Interview Place, Date: .... Assessor name:......................................

CLIENT INFORMATION

Participant number: .... Date of Birth: ....

Address: ....

....

Phone number(s): ....

Current life situation: ....

....

....

....

Occupation (past/current)...

Are you currently treated by another Mental Health services?.....If yes, which service?.................................

..................................., for how long................., and for which difficulties?...

....

....

....

....

How did you hear about the groups program? ....

....

Why are you interested in attending? ....

....

....

....

Is there anything else you hope this group can do for you?...

....

....

....

1/2

History

If applicable, for how long have you been experiencing your difficulties?

....

Are you currently, or have you in the past, received any treatment for these difficulties (either medication and / or therapy)?

....

....

....

Medication we should know about? ....

....

Physical disabilities? ....

....

Previous trauma? ....

....

....

Drug / Alcohol use? ....

....

Questionnaire administration and introduction to the group

1. Administer and score questionnaires (if possible). *Check the answers and clarify if necessary.*
2. Give information regarding the group. Clarify that admission to the group is dependent on numbers, and commitments (not dropping out, willingness to abstain from non-prescribed intoxicants, strict confidentiality, and respectful communication with other participants).

Tick adjacent box as you go.

- ☐ Explain: we select participants based on numbers and ability to commit to attend the entire program
- ☐ Describe general topics (meditative/experiential approach, CBT, evidenced based techniques)
- ☐ Candidate was give written information to keep (e.g., informative leaflet or brochure if available)
- ☐ Explain what are commitments to home exercises, group attendance and confidentiality
- ☐ Willingness to abstain or (negotiable) minimize intoxicants (e.g., alcohol, illicit drugs or unprescribed medication) with our help.

3. Assessor's comments and/or appraisal of this candidateship: ....

....

....

....

4. Candidate accepted (tick)? .....Yes ☐.......No ☐......Will be contacted?...Yes ☐.......No ☐......

These portions have been removed for copyright or proprietary reasons.

DASS21, Lovi&, Lovibond, S.H. & Lovibond, P.F (1995). Manual for the depression anxiety stress scales (2nd Ed.) Psychology Foundation

Satisfaction with life scales, Diener, E., Emmons, R.A. Larson, R.J., Journal of personality assessment, 49, 71-76

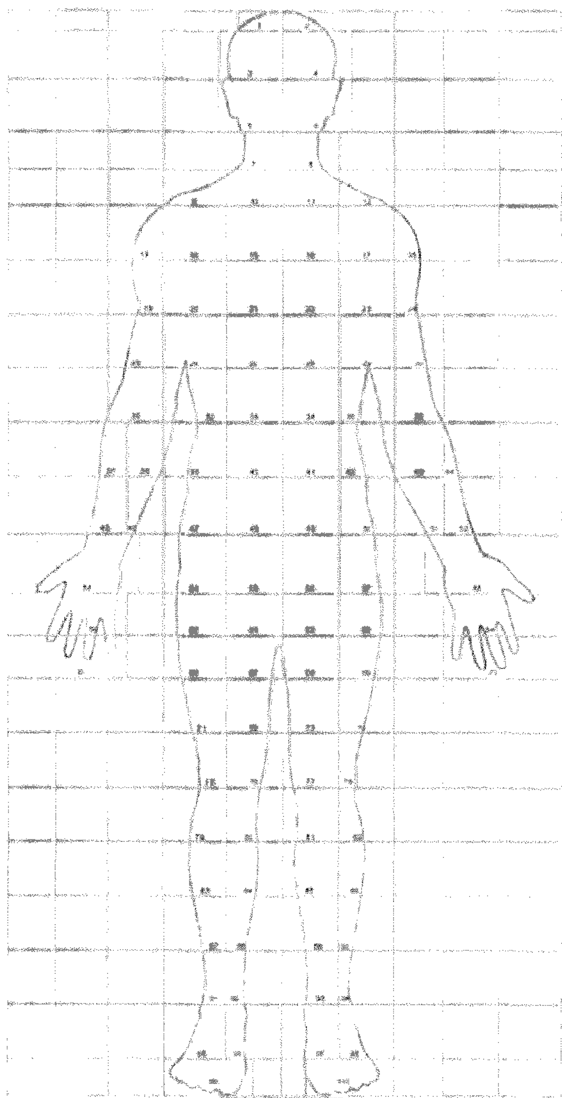
Difficulties in emotion regulation scale, Gratz, K. L., & Roemer, L. (2004) multidimensional assessment of emotion regulation and dysregulation:
Development, factor structure, and initial validation of the Difficulties in Emotion Regulation Scale. Journal Of
Psychopathology and Behavioral Assessment, 26, 41-54.

Five facet mindfulness questionnaire, Baer, R.A. [et al.] (2008) Construct validity of the facet mindfulness questionnaire in mediating and nonmediating samples, Assessment, 15, 329-342

Appendix J: Interoception Form

INTEROCEPTION FORM

Please colour the space in the silhouette where you can feel any type of body sensations. Try not to spend too long colouring the space. It is ok if you go slightly over the silhouette edge.



FRONT

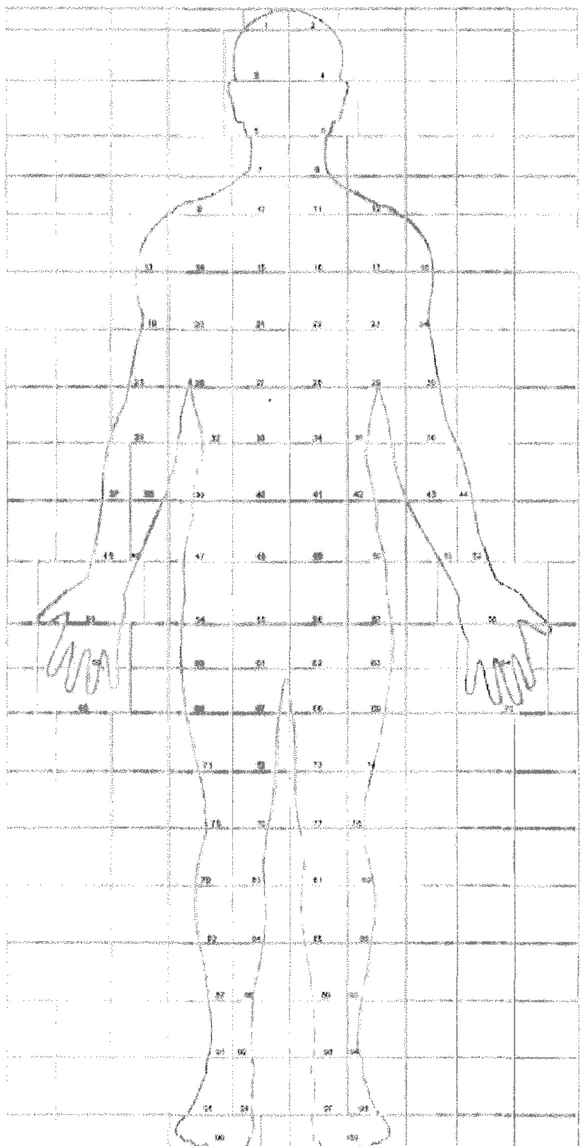
RESULTS

There are 100 numbered boxes (square and rectangular shapes) within or crossing the outline of the body above. To calculate the percentage of interoceptive awareness, count the total number of coloured boxes. A numbered box is counted as valid if at least half of its surface, which falls within the outline of the body, is coloured.

Interoceptive awareness for front: ......% **Total interoceptive awareness = (%back + %front / 2) =** ......%

Interoception Form

Please colour the space in the silhouette where you can feel any type of body sensations. Try not to spend too long colouring the space. It is ok if you go slightly over the silhouette edge.



BACK

RESULTS

There are 100 numbered boxes (square and rectangular shapes) within or crossing the outline of the body above. To calculate the percentage of interoceptive awareness, count the total number of coloured boxes. A numbered box is counted as valid if at least half of its surface, which falls within the outline of the body, is coloured.

Interoceptive awareness for back:……% Total interoceptive awareness = (%back + %front / 2) = …… %

Appendix K: Daily Schedule of Mindfulness Practice

DAILY SCHEDULE OF MINDFULNESS PRACTICE

Your Name: …………… ……………	Date	a.m. (circle)	Duration	Rating % (How satisfied were you with your practise?)	p.m. (circle)	Duration	Rating % (How satisfied were you with your practise?)
Monday		Yes / No			Yes / No		
Tuesday		Yes / No			Yes / No		
Wednesday		Yes / No			Yes / No		
Thursday		Yes / No			Yes / No		
Friday		Yes / No			Yes / No		
Saturday		Yes / No			Yes / No		
Sunday		Yes / No			Yes / No		

If you missed your practice, explain why: ____________________

____

____

Any comment about your practice? ____________________

____

V

Appendix L: Track Listings for CDs

Mindfulness of Breath

1. Rationale for Mindfulness Training (7:28)
2. Introduction to Mindfulness of Breath (1:57)
3. Mindfulness of Breath (18:07)

Body Scan (CD One)

1. Rationale for Mindfulness Training (7:28)
2. Introduction to Mindfulness of Breath (1:57)
3. Mindfulness of Breath (18:07)
4. Introduction to Body Scan (Basic) (1:43)
5. Body Scan (28:15)
6. Withdrawing the CD (2:29)

Body Scan (CD Two)

1. Intro to Advanced Scanning (1:52)
2. Symmetrical Scanning (16:09)
3. Intro to Partial Sweeping (1:18)
4. Partial Sweeping (14:34)
5. Intro to Sweeping En Masse (1:53)
6. Sweeping En Masse (15:04)
7. Intro to Transversal Scanning (1:40)
8. Transversal Scanning (16:13)

These [illegible]s have been removed for copyright or proprietary reasons.

Script for Mindfulness of Breath Track
From Cayoun, B.A. (2011). Mindfitlness-lntegrated CBT: Principles and practice.
UK: John Wiley and Sons, Ltd.
Example Script for Body Scanning Track
From Cayoun, B.A. (2011). Mindfitlness-Integrated CBT: Principles and practice. UK:
John Wiley and Sons, Ltd.
Outline of Mindfulness Training Programme for Each Group (MB, BS, and EDM)
Looking and Really Seeing Exercise (from EDM course week 3)
Ananda Sutta (from MOB course week 4) adapted from the Samyutta Nikaya 54.13
Vedana Readings (from BS course week 7) from Why Vedana and What is Vedana?
accessed from: http://www.vridhamma.org/Why-Vedana-and-What-is-Vedana.aspx
Sati Reading (from EDM and MOB courses week 7)
From: Ch. 13 (p.137 -148) in Gunaratana, H. (2002). Mindfulness in Plain English.
Wisdom Publications: Massachusetts, USA.

Appendix T: Statistical Output for Chi Square Analyses Assessing Differences Those Included in the Final Analyses and Those Who Were

1=all data; 2=not	2-Way Summary Table: Observed Frequencie Marked cells have counts > 10			
	Var2 1	Var2 2	Var2 3	Row Totals
1	32	40	28	100
2	44	46	48	138
Totals	76	86	76	238

Statistic	Statistics: 1=all data; 2=not(2) x Var2(3) (a		
	Chi-square	df	p
Pearson Chi-square	1.548754	df=2	p=.46099
M-L Chi-square	1.554016	df=2	p=.45978

1=all data; 2=not	2-Way Summary Table: Observed Frequencie Marked cells have counts > 10							
	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	Row Totals
1	2	4	13	22	17	23	10	91
2	0	4	4	9	10	10	2	39
Totals	2	8	17	31	27	33	12	130

Statistic	Statistics: 1=all data; 2=not(2) x AGE(7) (a		
	Chi-square	df	p
Pearson Chi-square	4.387713	df=6	p=.62436
M-L Chi-square	4.940084	df=6	p=.55152

1=all data; 2=not	2-Way Summary Table: Observed Frequencie Marked cells have counts > 10		
	GEN 1	GEN 2	Row Totals
1	20	72	92
2	7	32	39
Totals	27	104	131

Statistic	Statistics: 1=all data; 2=not(2) x GEN(2) (a		
	Chi-square	df	p
Pearson Chi-square	.2404914	df=1	p=.62385
M-L Chi-square	.2453463	df=1	p=.62037

1=all data; 2=not	2-Way Summary Table: Observed Frequencie Marked cells have counts > 10					
	EDU 1	EDU 2	EDU 3	EDU 4	EDU 5	Row Totals
1	10	4	29	24	25	92
2	5	1	12	9	12	39
Totals	15	5	41	33	37	131

Statistic	Statistics: 1=all data; 2=not(2) x EDU(5) (a		
	Chi-square	df	p
Pearson Chi-square	.5481768	df=4	p=.96864
M-L Chi-square	.5641036	df=4	p=.96697

1=all data; 2=not	2-Way Summary Table: Observed Frequencie Marked cells have counts > 10				
	MAR 1	MAR 2	MAR 3	MAR 4	Row Totals
1	18	55	16	2	91
2	9	25	5	0	39
Totals	27	80	21	2	130

Statistic	Statistics: 1=all data; 2=not(2) x MAR(4) (a		
	Chi-square	df	p
Pearson Chi-square	1.442744	df=3	p=.69555
M-L Chi-square	2.026409	df=3	p=.56695

1=all data; 2=not	2-Way Summary Table: Observed Frequencie Marked cells have counts > 10					
	WOR 1	WOR 2	WOR 3	WOR 4	WOR 8	Row Totals
1	27	29	11	23	1	91
2	14	10	6	8	0	38
Totals	41	39	17	31	1	129

Statistic	Statistics: 1=all data; 2=not(2) x WOR(5) (		
	Chi-square	df	p
Pearson Chi-square	1.602286	df=4	p=.80838
M-L Chi-square	1.873708	df=4	p=.75897

1=all data; 2=not	2-Way Summary Table: Observed Frequencie Marked cells have counts > 10					
	INC 1	INC 2	INC 3	INC 4	INC 5	Row Totals
1	9	14	31	24	12	90
2	0	5	12	10	5	32
Totals	9	19	43	34	17	122

Statistic	Statistics: 1=all data; 2=not(2) x INC(5) (al		
	Chi-square	df	p
Pearson Chi-square	3.529517	df=4	p=.47341
M-L Chi-square	5.798011	df=4	p=.21476

1=all data; 2=not	2-Way Summary Table: Observed Frequencie Marked cells have counts > 10 ILL - EVER Y	ILL - EVER N	Row Totals
1	26	65	91
2	13	25	38
Totals	39	90	129

Statistic	Statistics: 1=all data; 2=not(2) x ILL - EVEI Chi-square	df	p
Pearson Chi-square	.4041353	df=1	p=.52496
M-L Chi-square	.3989125	df=1	p=.52765

Appendix U: Not Statistical Output for Chi Square Analyses Assessing Differences Between the Three Groups on Demographic Variables

It was necessary to collapse some groups together, given some low frequencies.

Variable	MOB		BS		EDM		*Total*
SEX	Obs	Exp	Obs	Exp	Obs	Exp	
Male:	29	30.6	22	21.4	24	23	*75*
Female:	11	9.4	6	6.6	6	7	*23*
Total	*40*		*28*		*30*		***98***

The Expected value for any cell is calculated from the marginal totals & the total sample size. So, the expected value for the 'Male MOB' cell (observed value is '29') is (40 x 75)/98. Each cell contributes to the Chi^2 value using the calculation:

$(Obs - Exp)^2/Exp$ So, 'Male MOB' cell is $(29\text{-}30.6)^2/30.6 + (22\text{-}21.4)^2/21.4$….

$Chi^2 = 0.373$, df=2, non-significant

Variable	MOB		BS		EDM		*Total*
AGE	Obs	Exp	Obs	Exp	Obs	Exp	
≤ 45 yrs:	18	16.7	10	12.2	13	12.2	*41*
45+ yrs:	19	20.3	17	14.8	14	14.8	*50*
Total	*37*		*27*		*27*		***91***

$Chi^2 = 1.475$, df=2, non-significant

Variable *Total*	MOB		BS		EDM		
EDUCATION	Obs	Exp	Obs	Exp	Obs	Exp	
HS/Trade:	2	5.6	7	4.1	5	4.3	*14*
Cert/Dip:	12	11.7	9	8.5	8	8.8	*29*
Degree:	23	19.7	11	14.4	15	14.9	*49*
Total	*37*		*27*		*28*		***92***

Chi² = 5.946, df=4, non-significant

Variable *Total*	MOB		BS		EDM		
MARITAL	Obs	Exp	Obs	Exp	Obs	Exp	
Single:	8	6.6	5	6.7	5	4.7	*18*
DeFacto/Married	20	20	19	20.6	16	14.4	*55*
Sep/Divorced:	8	9.5	13	9.7	5	6.8	*26*
Total	*36*		*37*		*26*		***99***

Chi² = 2.886, df=4, non-significant

Variable	MOB		BS		EDM		*Total*
INCOME	Obs	Exp	Obs	Exp	Obs	Exp	
≤ $20KSingle:	9	9.5	8	6.9	6	6.6	*23*
$21K - $40K:	13	12.7	10	9.3	8	9	*31*
$41K - $80K:	10	9.9	5	7.2	9	6.9	*24*
>$80K	5	4.9	4	3.6	3	3.5	*12*
Total	*37*		*27*		*26*		***90***

Chi^2 = 1.856, df=6, non-significant

Appendix V: Statistical Output for One-Way ANOVAs Assessing Differences Between the Three Groups on the DVs at Baseline

SWLS

Effect	Univariate Tests of Significance, Effect Sizes, and Powers for BS2LSSUM (statistica data recc Sigma-restricted parameterization Effective hypothesis decomposition SS	Degr. of Freedom	MS	F	p	Partial eta-squared	Non-centrality
Intercept	50125.73	1	50125.73	1176.834	0.000000	0.923852	1176.834
group	79.35	2	39.67	0.931	0.397468	0.018844	1.863
Error	4131.59	97	42.59				

Effect	Univariate Tests of Significance, Effect Sizes, and Powers for BS2LSSUM (statistica data recc Sigma-restricted parameterization Effective hypothesis decomposition Observed power (alpha=0.05)
Intercept	1.000000
group	0.207133
Error	

FFMQ

Effect	Univariate Tests of Significance, Effect Sizes, and Powers for BS2:MQtotal (statistica data rec Sigma-restricted parameterization Effective hypothesis decomposition SS	Degr. of Freedom	MS	F	p	Partial eta-squared	Non-centrality
Intercept	1341968	1	1341968	59462.76	0.000000	0.998371	59462.76
group	34	2	17	0.75	0.475517	0.015210	1.50
Error	2189	97	23				

Effect	Univariate Tests of Significance, Effect Sizes, and Powers for BS2:MQtotal (statistica data rec Sigma-restricted parameterization Effective hypothesis decomposition Observed power (alpha=0.05)
Intercept	1.000000
group	0.173942
Error	

DASS Stress

Effect	Univariate Tests of Significance, Effect Sizes, and Powers for S2 (statistica data recoded DAS Sigma-restricted parameterization Effective hypothesis decomposition SS	Degr. of Freedom	MS	F	p	Partial eta-squared	Non-centrality
Intercept	8118.151	1	8118.151	331.5885	0.000000	0.773676	331.5885
group	132.521	2	66.260	2.7064	0.071819	0.052853	5.4129
Error	2374.813	97	24.483				

Effect	Univariate Tests of Significance, Effect Sizes, and Powers for S2 (statistica data recoded DAS Sigma-restricted parameterization Effective hypothesis decomposition Observed power (alpha=0.05)
Intercept	1.000000
group	0.524384
Error	

DASS Anxiety

	Univariate Tests of Significance, Effect Sizes, and Powers for A2 (statistica data recoded DAS Sigma-restricted parameterization Effective hypothesis decomposition						
Effect	SS	Degr. of Freedom	MS	F	p	Partial eta-squared	Non-centrality
Intercept	2214.427	1	2214.427	126.3735	0.000000	0.565750	126.3735
group	72.832	2	36.416	2.0782	0.130693	0.041089	4.1564
Error	1699.719	97	17.523				

Effect	Univariate Tests of Significance, Effect Sizes, and Powers for A2 (statistica data recoded DAS Sigma-restricted parameterization Effective hypothesis decomposition Observed power (alpha=0.05)
Intercept	1.000000
group	0.418159
Error	

DASS Depression

	Univariate Tests of Significance, Effect Sizes, and Powers for D2 (statistica data recoded DAS Sigma-restricted parameterization Effective hypothesis decomposition						
Effect	SS	Degr. of Freedom	MS	F	p	Partial eta-squared	Non-centrality
Intercept	2946.883	1	2946.883	121.0531	0.000000	0.555154	121.0531
group	69.664	2	34.832	1.4309	0.244107	0.028657	2.8617
Error	2361.341	97	24.344				

Effect	Univariate Tests of Significance, Effect Sizes, and Powers for D2 (statistica data recoded DAS Sigma-restricted parameterization Effective hypothesis decomposition Observed power (alpha=0.05)
Intercept	1.000000
group	0.299924
Error	

DERS

	Univariate Tests of Significance, Effect Sizes, and Powers for BS2:EM (statistica data recodec Sigma-restricted parameterization Effective hypothesis decomposition						
Effect	SS	Degr. of Freedom	MS	F	p	Partial eta-squared	Non-centrality
Intercept	807616.8	1	807616.8	1561.160	0.000000	0.941501	1561.160
group	3314.7	2	1657.4	3.204	0.044943	0.061963	6.407
Error	50179.9	97	517.3				

Effect	Univariate Tests of Significance, Effect Sizes, and Powers for BS2:EM (statistica data recodec Sigma-restricted parameterization Effective hypothesis decomposition Observed power (alpha=0.05)
Intercept	1.000000
group	0.599951
Error	

Cell No.	Tukey HSD test; variable BS2:EM (statistica data recoded Approximate Probabilities for Post Hoc Tests Error: Between MS = 517.32, df = 97.000 group	{1} 82.750	{2} 95.643	{3} 94.136
1	EDM		0.048894	0.134628
2	MOB	0.048894		0.961005
3	BS	0.134628	0.961005	

Group Means and Standard Deviations for DVs

Variable	group=EDM Descriptive Statistics (statistica data recoded DASS Valid N	Mean	Minimum	Maximum	Std.De
BS2:EM	32	82.7500	37.0000	120.000C	18.048
BS2LSSUM	32	23.6719	9.0000	33.0000	5.616
BS2:MQtotal	32	116.5781	104.000C	127.000C	4.736
S2	32	8.1297	0.0000	18.1500	4.643
A2	32	4.0313	0.0000	16.0000	3.632
D2	32	4.5313	1.0000	14.0000	4.087
BS2:I:TO	32	9.2813	0.0000	100.000C	18.343

Variable	group=MOB Descriptive Statistics (statistica data recoded DASS Valid N	Mean	Minimum	Maximum	Std.De
BS2:EM	40	95.6430	56.0000	136.0000	23.407
BS2LSSUM	40	22.8378	9.0000	35.0000	6.860
BS2:MQtotal	40	116.7608	104.000C	126.000C	4.593
S2	40	10.6500	2.0000	21.0000	5.211
A2	40	5.9000	0.0000	17.0000	4.573
D2	40	6.5000	0.0000	20.0000	5.611
BS2:I:TO	40	8.4125	0.0000	55.5000	10.909

Variable	group=BS Descriptive Statistics (statistica data recoded DASS Valid N	Mean	Minimum	Maximum	Std.De
BS2:EM	28	94.1357	47.0000	149.0000	26.326
BS2LSSUM	28	21.3857	7.0000	35.0000	6.986
BS2:MQtotal	28	117.9632	105.000C	127.4000	4.983
S2	28	8.5439	1.0000	17.000C	4.896
A2	28	4.3393	0.0000	14.0000	4.195
D2	28	5.4311	0.0000	18.5000	4.774
BS2:I:TO	28	8.1607	0.0000	32.5000	7.413

Appendix W: ANOVAs Comparing Change Over Time on the DVs for MOB, BS, and EDM (Hypothesis 1)

DASS Stress

Effect	Repeated Measures Analysis of Variance with Effect Sizes and Powers (statistica data rec Sigma-restricted parameterization Effective hypothesis decomposition SS	Degr. of Freedom	MS	F	p	Partial eta-squared	Non-centrality
Intercept	15741.11	1	15741.11	315.7470	0.000000	0.764989	315.7470
group	112.50	2	56.25	1.1283	0.327785	0.022735	2.2566
Error	4835.79	97	49.85				
TIME	1096.66	3	365.55	43.6178	0.000000	0.310187	130.8533
TIME*group	116.98	6	19.50	2.3263	0.032847	0.045769	13.9576
Error	2438.82	291	8.38				

(final column of table above)

Effect	Repeated Measures Analysis of Variance with Effect Sizes and Powers (statistica data rec Sigma-restricted parameterization Effective hypothesis decomposition Observed power (alpha=0.05)
Intercept	1.000000
group	0.243540
Error	
TIME	1.000000
TIME*group	0.801220
Error	

LSD test; variable DV_1 (statistica data recoded DASS scores + Age Group YO. new EM totals
Probabilities for Post Hoc Tests
Error: Between; Within; Pooled MS = 18.749, df = 202.35

Cell No.	group	TIME	{1} 8.1297	{2} 5.6094	{3} 3.7812	{4} 5.5000	{5} 10.650	{6} 6.1562	{7} 5.0265
1	EDM	S2		0.000573	0.000000	0.000330	0.014966	0.056055	0.002838
2	EDM	S4	0.000573		0.012070	0.879982	0.000002	0.594949	0.570951
3	EDM	S8	0.000000	0.012070		0.018206	0.000000	0.021746	0.226709
4	EDM	S3m	0.000330	0.879982	0.018206		0.000001	0.523528	0.645242
5	MOB	S2	0.014966	0.000002	0.000000	0.000001		0.000000	0.000000
6	MOB	S4	0.056055	0.594949	0.021746	0.523528	0.000000		0.082000
7	MOB	S8	0.002838	0.570951	0.226709	0.645242	0.000000	0.082000	
8	MOB	S3m	0.056831	0.590749	0.021407	0.519585	0.000000	0.992303	0.080331
9	BS	S2	0.711997	0.009487	0.000033	0.007167	0.049747	0.026317	0.001155
10	BS	S4	0.175719	0.374272	0.012439	0.324293	0.000199	0.673029	0.140031
11	BS	S8	0.012989	0.797455	0.170792	0.873538	0.000001	0.434862	0.782501
12	BS	S3m	0.001919	0.372142	0.461929	0.426478	0.000000	0.148069	0.694695

(final columns of previous table)

Cell No.	{8} 6.1625	{9} 8.5439	{10} 6.6071	{11} 5.3214	{12} 4.6071
LSD test; variable DV_1 (statistica data recoded DASS scores + Age Group YO. new EM totals Probabilities for Post Hoc Tests Error: Between; Within; Pooled MS = 18.749, df = 202.35					
1	0.056831	0.711997	0.175719	*0.012989*	*0.001919*
2	0.590749	*0.009487*	0.374272	0.797455	0.372142
3	*0.021407*	*0.000033*	*0.012439*	0.170792	0.461929
4	0.519585	*0.007167*	0.324293	0.873538	0.426478
5	*0.000000*	*0.049747*	*0.000199*	*0.000001*	*0.000000*
6	0.992303	*0.026317*	0.673029	0.434862	0.148069
7	0.080331	*0.001155*	0.140031	0.782501	0.694695
8		*0.026708*	0.677302	0.431437	0.146448
9	*0.026708*		*0.012854*	*0.000041*	*0.000001*
10	0.677302	*0.012854*		0.097640	*0.010226*
11	0.431437	*0.000041*	0.097640		0.356672
12	0.146448	*0.000001*	*0.010226*	0.356672	

DASS Anxiety

Effect	SS	Degr. of Freedom	MS	F	p	Partial eta-squared	Non-centrality
Repeated Measures Analysis of Variance with Effect Sizes and Powers (statistica data rec Sigma-restricted parameterization Effective hypothesis decomposition							
Intercept	*3722.193*	*1*	*3722.193*	*128.1572*	*0.000000*	*0.569190*	*128.1572*
group	50.273	2	25.137	0.8655	0.424077	0.017532	1.7309
Error	2817.265	97	29.044				
TIME	*391.014*	*3*	*130.338*	*29.1771*	*0.000000*	*0.231239*	*87.5313*
TIME*group	44.392	6	7.399	1.6562	0.131629	0.033021	9.9374
Error	1299.936	291	4.467				

(final column of table above)

Effect	Observed power (alpha=0.05)
Repeated Measures Analysis of Variance with Effect Sizes and Powers (statistica data rec Sigma-restricted parameterization Effective hypothesis decomposition	
Intercept	*1.000000*
group	0.195047
Error	
TIME	*1.000000*
TIME*group	0.629396
Error	

DASS Depression

Effect	SS	Degr. of Freedom	MS	F	p	Partial eta-squared	Non-centrality
Intercept	5100.280	1	5100.280	109.8512	0.000000	0.531064	109.8512
group	50.103	2	25.052	0.5396	0.584739	0.011003	1.0791
Error	4503.613	97	46.429				
TIME	545.407	3	181.802	27.5297	0.000000	0.221070	82.5892
TIME*group	79.434	6	13.239	2.0047	0.065002	0.039694	12.0284
Error	1921.723	291	6.604				

Repeated Measures Analysis of Variance with Effect Sizes and Powers (statistica data rec
Sigma-restricted parameterization
Effective hypothesis decomposition

(final column of table above)

Effect	Observed power (alpha=0.05)
Intercept	1.000000
group	0.136855
Error	
TIME	1.000000
TIME*group	0.728297
Error	

Repeated Measures Analysis of Variance with Effect Sizes and Powers (statistica data rec
Sigma-restricted parameterization
Effective hypothesis decomposition

Difficulties in Emotion Regulation Scale

Effect	SS	Degr. of Freedom	MS	F	p	Partial eta-squared	Non-centrality
Intercept	2152815	1	2152815	1704.349	0.000000	0.946151	1704.349
group	6231	2	3115	2.466	0.090206	0.048391	4.933
Error	122524	97	1263				
TIME	41396	3	13799	111.598	0.000000	0.534990	334.793
TIME*group	1600	6	267	2.157	0.047199	0.042581	12.942
Error	35981	291	124				

Repeated Measures Analysis of Variance with Effect Sizes and Powers (statistica data rec
Sigma-restricted parameterization
Effective hypothesis decomposition

(final column of table above)

Effect	Observed power (alpha=0.05)
Intercept	1.000000
group	0.485077
Error	
TIME	1.000000
TIME*group	0.764982
Error	

Repeated Measures Analysis of Variance with Effect Sizes and Powers (statistica data rec
Sigma-restricted parameterization
Effective hypothesis decomposition

LSD test; variable DV_1 (statistica data recoded DASS scores + Age Group YO. new EM totals
Probabilities for Post Hoc Tests
Error: Between; Within; Pooled MSE = 408.52, df = 157.80

Cell No.	group	TIME	{1} 82.750	{2} 68.422	{3} 62.969	{4} 62.500	{5} 95.643	{6} 77.788	{7} 69.775	{8} 70.827
1	EDM	BS2:EM		0.0000	0.0000	0.0000	0.0079	0.3021	0.0075	0.0139
2	EDM	4W:EM	0.0000		0.0508	0.0340	0.0000	0.0525	0.7781	0.6166
3	EDM	8W:EM	0.0000	0.0508		0.8662	0.0000	0.0024	0.1576	0.1032
4	EDM	3M:EM	0.0000	0.0340	0.8662		0.0000	0.0017	0.1311	0.0843
5	MOB	BS2:EM	0.0079	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
6	MOB	4W:EM	0.3021	0.0525	0.0024	0.0017	0.0000		0.0014	0.0055
7	MOB	8W:EM	0.0075	0.7781	0.1576	0.1311	0.0000	0.0014		0.6726
8	MOB	3M:EM	0.0139	0.6166	0.1032	0.0843	0.0000	0.0055	0.6726	
9	BS	BS2:EM	0.0310	0.0000	0.0000	0.0000	0.7626	0.0013	0.0000	0.0000
10	BS	4W:EM	0.2733	0.1030	0.0081	0.0062	0.0003	0.8746	0.1488	0.2170
11	BS	8W:EM	0.0026	0.7479	0.4722	0.4190	0.0000	0.0279	0.5428	0.4129
12	BS	3M:EM	0.0001	0.1787	0.7584	0.8273	0.0000	0.0012	0.0930	0.0591

(final columns of table above)

LSD test; variable DV_1 (statistica data recoded DASS scores + Age Group YO. new EM totals
Probabilities for Post Hoc Tests
Error: Between; Within; Pooled MSE = 408.52, df = 157.80

Cell No.	{9} 94.136	{10} 77.000	{11} 66.738	{12} 61.357
1	0.0310	0.2733	0.0026	0.0001
2	0.0000	0.1030	0.7479	0.1787
3	0.0000	0.0081	0.4722	0.7584
4	0.0000	0.0062	0.4190	0.8273
5	0.7626	0.0003	0.0000	0.0000
6	0.0013	0.8746	0.0279	0.0012
7	0.0000	0.1488	0.5428	0.0930
8	0.0000	0.2170	0.4129	0.0591
9		0.0000	0.0000	0.0000
10	0.0000		0.0006	0.0000
11	0.0000	0.0006		0.0712
12	0.0000	0.0000	0.0712	

Satisfaction with Life Scale

Repeated Measures Analysis of Variance with Effect Sizes and Powers (statistica data rec
Sigma-restricted parameterization
Effective hypothesis decomposition

Effect	SS	Degr. of Freedom	MS	F	p	Partial eta-squared	Non-centrality
Intercept	238394.5	1	238394.5	1772.117	0.000000	0.948104	1772.117
group	107.6	2	53.8	0.400	0.671485	0.008178	0.800
Error	13048.9	97	134.5				
TIME	622.7	3	207.6	19.997	0.000000	0.170921	59.992
TIME*group	81.1	6	13.5	1.301	0.256361	0.026132	7.808
Error	3020.7	291	10.4				

(final column of previous table)

Effect	Repeated Measures Analysis of Variance with Effect Sizes and Powers (statistica data rec Sigma-restricted parameterization Effective hypothesis decomposition Observed power (alpha=0.05)
Intercept	1.000000
group	0.112983
Error	
TIME	1.000000
TIME*group	0.508655
Error	

Five Factor Mindfulness Questionnaire

	Repeated Measures Analysis of Variance with Effect Sizes and Powers (statistica data rec Sigma-restricted parameterization Effective hypothesis decomposition						
Effect	SS	Degr. of Freedom	MS	F	p	Partial eta-squared	Non-centrality
Intercept	5213138	1	5213138	111676.0	0.000000	0.999132	111676.0
group	18	2	9	0.2	0.824177	0.003979	0.4
Error	4528	97	47				
TIME	495	3	165	13.4	0.000000	0.121549	40.3
TIME*group	62	6	10	0.8	0.534285	0.017171	5.1
Error	3575	291	12				

(final column of above table)

Effect	Repeated Measures Analysis of Variance with Effect Sizes and Powers (statistica data rec Sigma-restricted parameterization Effective hypothesis decomposition Observed power (alpha=0.05)
Intercept	1.000000
group	0.079378
Error	
TIME	0.999909
TIME*group	0.334548
Error	

Appendix X: Correlations for Baseline to 8-week Change Scores for each DV and Baseline to 8-week Change Scores for Interoception (Hypothesis 2)

Correlations between change score for Interoception (NewVar29) and change score for Anxiety.

	Correlations (statistica data) Marked correlations are significant at p < .05000 N=100 (Casewise deletion of missing data)			
Variable	Means	Std.Dev.	A.diff.base-8w	NewVar29
A.diff.base-8w	-2.74000	3.60651	1.000000	0.10518
NewVar29	18.17500	33.69354	0.105186	1.00000

	group=EDM Correlations (statistica data) Marked correlations are significant at p < .05000 N=32 (Casewise deletion of missing data)			
Variable	Means	Std.Dev.	A.diff.base-8w	NewVar29
A.diff.base-8w	-2.06250	3.11021	1.000000	0.23987
NewVar29	11.03125	24.47577	0.239871	1.00000

	group=MOB Correlations (statistica data) Marked correlations are significant at p < .05000 N=40 (Casewise deletion of missing data)			
Variable	Means	Std.Dev.	A.diff.base-8w	NewVar29
A.diff.base-8w	-3.63750	3.86302	1.000000	0.23749
NewVar29	1.68750	13.68168	0.237492	1.00000

	group=BS Correlations (statistica data) Marked correlations are significant at p < .05000 N=28 (Casewise deletion of missing data)			
Variable	Means	Std.Dev.	A.diff.base-8w	NewVar29
A.diff.base-8w	-2.23214	3.60907	1.000000	-0.16891
NewVar29	49.89286	41.20575	-0.168916	1.00000

Correlations between change score for Interoception (NewVar29) and change score for Depression.

Variable	Correlations (statistica data) Marked correlations are significant at p < .05000 N=100 (Casewise deletion of missing data)			
Variable	Means	Std.Dev.	D.diff.base-8w	NewVar29
D.diff.base-8w	-3.14940	4.18110	1.000000	0.05203
NewVar29	18.17500	33.69354	0.052038	1.00000

Variable	group=EDM Correlations (statistica data) Marked correlations are significant at p < .05000 N=32 (Casewise deletion of missing data)			
Variable	Means	Std.Dev.	D.diff.base-8w	NewVar29
D.diff.base-8w	-2.64656	2.96734	1.000000	0.29523
NewVar29	11.03125	24.47577	0.295230	1.00000

Variable	group=MOB Correlations (statistica data) Marked correlations are significant at p < .05000 N=40 (Casewise deletion of missing data)			
Variable	Means	Std.Dev.	D.diff.base-8w	NewVar29
D.diff.base-8w	-4.16225	4.46418	1.000000	0.13248
NewVar29	1.68750	13.68168	0.132489	1.00000

Variable	group=BS Correlations (statistica data) Marked correlations are significant at p < .05000 N=28 (Casewise deletion of missing data)			
Variable	Means	Std.Dev.	D.diff.base-8w	NewVar29
D.diff.base-8w	-2.27714	4.75340	1.000000	-0.29918
NewVar29	49.89286	41.20575	-0.299185	1.00000

Correlations between change score for Interoception (NewVar29/ Int.diff.base-8w) and change score for Stress.

Variable	Correlations (statistica data recoded DASS sco Marked correlations are significant at p < .0500 N=100 (Casewise deletion of missing data)			
Variable	Means	Std.Dev.	S.diff.base-8w	Int.diff.ba
S.diff.base-8w	-4.54320	4.54889	1.000000	0
Int.diff.base-8w	18.17500	33.69354	0.035776	1

Variable	group=EDM Correlations (statistica data) Marked correlations are significant at p < .05000 N=32 (Casewise deletion of missing data)			
Variable	Means	Std.Dev.	S.diff.base-8w	NewVar29
S.diff.base-8w	-4.34844	3.62090	1.000000	-0.06074
NewVar29	11.03125	24.47577	-0.060741	1.00000

Variable	group=MOB Correlations (statistica data) Marked correlations are significant at p < .05000 N=40 (Casewise deletion of missing data)			
Variable	Means	Std.Dev.	S.diff.base-8w	NewVar29
S.diff.base-8w	-5.62350	4.44629	1.000000	0.05148
NewVar29	1.68750	13.68168	0.051485	1.00000

Variable	group=BS Correlations (statistica data) Marked correlations are significant at p < .05000 N=28 (Casewise deletion of missing data)			
Variable	Means	Std.Dev.	S.diff.base-8w	NewVar29
S.diff.base-8w	-3.22250	5.35539	1.000000	-0.21034
NewVar29	49.89286	41.20575	-0.210343	1.00000

Correlations between change score for Interoception (Int.diff.base-8w) and change score for Difficulties in Emotion Regulation.

Variable	Correlations (statistica data) Marked correlations are significant at p < .05000 N=100 (Casewise deletion of missing data)			
Variable	Means	Std.Dev.	EM.diff.base-8w	Int.diff.base-8w
EM.diff.base-8w	-8.11080	8.65780	1.000000	-0.077809
Int.diff.base-8w	18.17500	33.69354	-0.077809	1.000000

Variable	group=EDM Correlations (statistica data) Marked correlations are significant at p < .05000 N=32 (Casewise deletion of missing data)			
Variable	Means	Std.Dev.	EM.diff.base-8w	Int.diff.base-8w
EM.diff.base-8w	-4.85938	6.07113	1.000000	0.118987
Int.diff.base-8w	11.03125	24.47577	0.118987	1.000000

Variable	group=BS Correlations (statistica data) Marked correlations are significant at p < .05000 N=28 (Casewise deletion of missing data)			
Variable	Means	Std.Dev.	EM.diff.base-8w	Int.diff.base-8w
EM.diff.base-8w	-10.3679	10.06285	1.000000	-0.056637
Int.diff.base-8w	49.8929	41.20575	-0.056637	1.000000

Variable	group=MOB Correlations (statistica data) Marked correlations are significant at p < .05000 N=40 (Casewise deletion of missing data)			
Variable	Means	Std.Dev.	EM.diff.base-8w	Int.diff.base-8w
EM.diff.base-8w	-9.13200	8.80192	1.000000	-0.018490
Int.diff.base-8w	1.68750	13.68168	-0.018490	1.000000

Correlations between change score for Interoception (Int.diff.base-8w) and change score for Satisfaction with Life Scale.

Variable	All Groups Correlations (statistica data) Marked correlations are significant at p < .05000 N=100 (Casewise deletion of missing data)			
Variable	Means	Std.Dev.	LS.diff.base-8w	Int.diff.base-8w
LS.diff.base-8w	2.76600	4.77219	1.000000	0.214206
Int.diff.base-8w	18.17500	33.69354	0.214206	1.000000

Variable	group=EDM Correlations (statistica data) Marked correlations are significant at p < .05000 N=32 (Casewise deletion of missing data)			
Variable	Means	Std.Dev.	LS.diff.base-8w	Int.diff.base-8w
LS.diff.base-8w	2.42187	4.08994	1.000000	0.234941
Int.diff.base-8w	11.03125	24.47577	0.234941	1.000000

Variable	group=MOB Correlations (statistica data) Marked correlations are significant at p < .05000 N=40 (Casewise deletion of missing data)			
Variable	Means	Std.Dev.	LS.diff.base-8w	Int.diff.base-8w
LS.diff.base-8w	2.524000	4.31361	1.000000	-0.066462
Int.diff.base-8w	1.687500	13.68168	-0.066462	1.000000

Variable	group=BS Correlations (statistica data) Marked correlations are significant at p < .05000 N=28 (Casewise deletion of missing data)			
Variable	Means	Std.Dev.	LS.diff.base-8w	Int.diff.base-8w
LS.diff.base-8w	3.50500	6.05209	1.000000	0.287993
Int.diff.base-8w	49.89286	41.20575	0.287993	1.000000

Correlations between change score for Interoception (Int.diff.base-8w) and change score for Five Factor Mindfulness Questionnaire.

Variable	All Groups Correlations (statistica data recoded DASS scores + Age Marked correlations are significant at p < .05000 N=100 (Casewise deletion of missing data)			
	Means	Std.Dev.	MQ.diff.base-8w	Int.diff.base-8w
MQ.diff.base-8w	-2.85780	5.26805	1.000000	-0.222927
Int.diff.base-8w	18.17500	33.69354	-0.222927	1.000000

Variable	group=EDM Correlations (statistica data recoded DASS scores + Age Marked correlations are significant at p < .05000 N=32 (Casewise deletion of missing data)			
	Means	Std.Dev.	MQ.diff.base-8w	Int.diff.base-8w
MQ.diff.base-8w	-2.65062	4.05596	1.000000	0.092681
Int.diff.base-8w	11.03125	24.47577	0.092681	1.000000

Variable	group=MOB Correlations (statistica data recoded DASS scores + Age Marked correlations are significant at p < .05000 N=40 (Casewise deletion of missing data)			
	Means	Std.Dev.	MQ.diff.base-8w	Int.diff.base-8w
MQ.diff.base-8w	-2.17025	5.41570	1.000000	-0.265157
Int.diff.base-8w	1.68750	13.68168	-0.265157	1.000000

Variable	group=BS Correlations (statistica data recoded DASS scores + Age (Marked correlations are significant at p < .05000 N=28 (Casewise deletion of missing data)			
	Means	Std.Dev.	MQ.diff.base-8w	Int.diff.base-8w
MQ.diff.base-8w	-4.07679	6.18169	1.000000	-0.269426
Int.diff.base-8w	49.89286	41.20575	-0.269426	1.000000

Appendix Y: Correlations for Baseline to 8-week Change Scores for each DV and Variables Reflecting At-home Meditation Practise (Hypothesis 3)

Across groups correlations for all DVs.

	All Groups Correlations (statistica data recoded DASS scores + Age Group YO. new EM totals adde Marked correlations are significant at p < .05000 N=68 (Casewise deletion of missing data)				
Variable	MQ.diff.base-8w	LS.diff.base-8w	EM.diff.base-8w	D.diff.base-8w	A.diff.base-8w
T:totalmins	-0.097046	-0.012926	-0.039246	0.103426	*0.449479*
T:no. sessions	-0.204174	0.140977	-0.078290	0.034062	0.202849
T:av. mins	0.115060	-0.209918	0.124110	0.130768	0.145494
T:no. days	-0.182067	0.060229	0.085466	0.151839	*0.364359*

	All Groups Correlations (statistica data recoded DASS scores + Age Group YO. new EM totals adde Marked correlations are significant at p < .05000 N=68 (Casewise deletion of missing data)
Variable	S.diff.base-8w
T:totalmins	*0.385538*
T:no. sessions	0.166829
T:av. mins	0.114782
T:no. days	*0.367475*

Correlations for all DVs for those in Mindfulness of Breath group.

	group=MOB Correlations (statistica data recoded DASS scores + Age Group YO. new EM totals adde Marked correlations are significant at p < .05000 N=40 (Casewise deletion of missing data)				
Variable	MQ.diff.base-8w	LS.diff.base-8w	EM.diff.base-8w	D.diff.base-8w	A.diff.base-8w
T:totalmins	-0.074906	-0.078406	0.065543	0.131845	*0.437050*
T:no. sessions	-0.236585	0.074636	-0.084547	0.068072	0.162171
T:av. mins	0.110029	-0.283393	0.180461	0.227103	0.225808
T:no. days	-0.287885	0.043855	0.124711	0.090907	*0.412774*

	group=MOB Correlations (statistica data recoded DASS scores + Age Group YO. new EM totals adde Marked correlations are significant at p < .05000 N=40 (Casewise deletion of missing data)
Variable	S.diff.base-8w
T:totalmins	*0.475305*
T:no. sessions	0.179919
T:av. mins	0.220294
T:no. days	*0.410399*

Correlations for all DVs for those in Body Scanning group.

Variable	group=BS Correlations (statistica data recoded DASS scores + Age Group YO. new EM totals adde Marked correlations are significant at p < .05000 N=28 (Casewise deletion of missing data)				
	MQ.diff.base-8w	LS.diff.base-8w	EM.diff.base-8w	D.diff.base-8w	A.diff.base-8w
T:totalmins	-0.040318	0.007569	-0.136891	-0.053091	*0.403831*
T:no. sessions	-0.080749	0.233270	-0.070904	-0.165698	0.209261
T:av. mins	0.224044	-0.313874	0.162062	0.122522	0.225227
T:no. days	0.200724	0.029675	0.095377	0.155910	0.125551

Variable	group=BS Correlations (statistica data recoded DASS scores + Age Group YO. new EM totals adde Marked correlations are significant at p < .05000 N=28 (Casewise deletion of missing data)
	S.diff.base-8w
T:totalmins	0.186476
T:no. sessions	0.039372
T:av. mins	0.296944
T:no. days	0.200607

Appendix Z: ANOVAs comparing MOB and BS on Practice Variables

ANOVA for variable representing total number of days on which meditation was practiced at home.

Effect	Univariate Tests of Significance, Effect Sizes, and Powers for T:no. days (statistica data recod Sigma-restricted parameterization Effective hypothesis decomposition						
	SS	Degr. of Freedom	MS	F	p	Partial eta-squared	Non-centrality
Intercept	215462.8	1	215462.8	6225.408	0.000000	0.989510	6225.408
group	197.4	1	197.4	5.703	0.019802	0.079541	5.703
Error	2284.3	66	34.6				

Effect	Univariate Tests of Significance, Effect Sizes, and Powers for T:no. days (statistica data recod Sigma-restricted parameterization Effective hypothesis decomposition
	Observed power (alpha=0.05)
Intercept	1.000000
group	0.652976
Error	

ANOVA for variable representing average number of minutes for which meditation was practiced during at home sessions.

Effect	Univariate Tests of Significance, Effect Sizes, and Powers for T:av. mins (statistica data recod Sigma-restricted parameterization Effective hypothesis decomposition						
	SS	Degr. of Freedom	MS	F	p	Partial eta-squared	Non-centrality
Intercept	12843022	1	12843022	18.00952	0.000070	0.214375	18.00952
group	1629968	1	1629968	2.28567	0.135347	0.033472	2.28567
Error	47066200	66	713124				

Effect	Univariate Tests of Significance, Effect Sizes, and Powers for T:av. mins (statistica data recod Sigma-restricted parameterization Effective hypothesis decomposition
	Observed power (alpha=0.05)
Intercept	0.986834
group	0.319423
Error	

ANOVA for variable representing total number of sessions of meditation practiced at home.

Effect	Univariate Tests of Significance, Effect Sizes, and Powers for T:no. sessions (statistica data re Sigma-restricted parameterization Effective hypothesis decomposition						
	SS	Degr. of Freedom	MS	F	p	Partial eta-squared	Non-centrality
Intercept	683592.1	1	683592.1	1954.907	0.000000	0.967341	1954.907
group	931.0	1	931.0	2.663	0.107499	0.038777	2.663
Error	23078.9	66	349.7				

Effect	Univariate Tests of Significance, Effect Sizes, and Powers for T:no. sessions (statistica data re Sigma-restricted parameterization Effective hypothesis decomposition Observed power (alpha=0.05)
Intercept	1.000000
group	0.362611
Error	

ANOVA for variable representing total number of minutes on which meditation was practiced at home.

	Univariate Tests of Significance, Effect Sizes, and Powers for T:totalmins (statistica data reco Sigma-restricted parameterization Effective hypothesis decomposition						
Effect	SS	Degr. of Freedom	MS	F	p	Partial eta-squared	Non-centrality
Intercept	560336006	1	560336006	2073.824	0.000000	0.969156	2073.824
group	1104120	1	1104120	4.086	0.047288	0.058305	4.086
Error	17832844	66	270195				

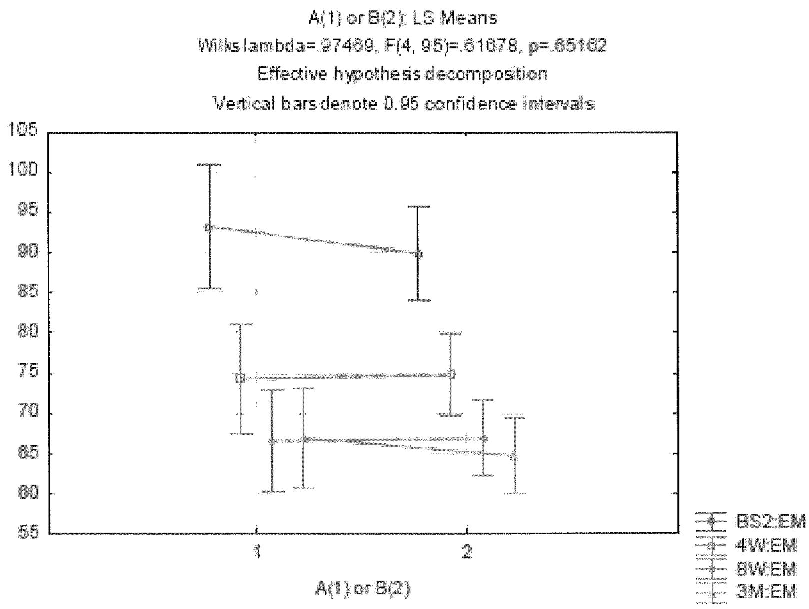
Effect	Univariate Tests of Significance, Effect Sizes, and Powers for T:totalmins (statistica data reco Sigma-restricted parameterization Effective hypothesis decomposition Observed power (alpha=0.05)
Intercept	1.000000
group	0.512827
Error	

Appendix AA: ANOVAs comparing DV Change Scores for 2010 [A(1)] to

2011 [B(2)]

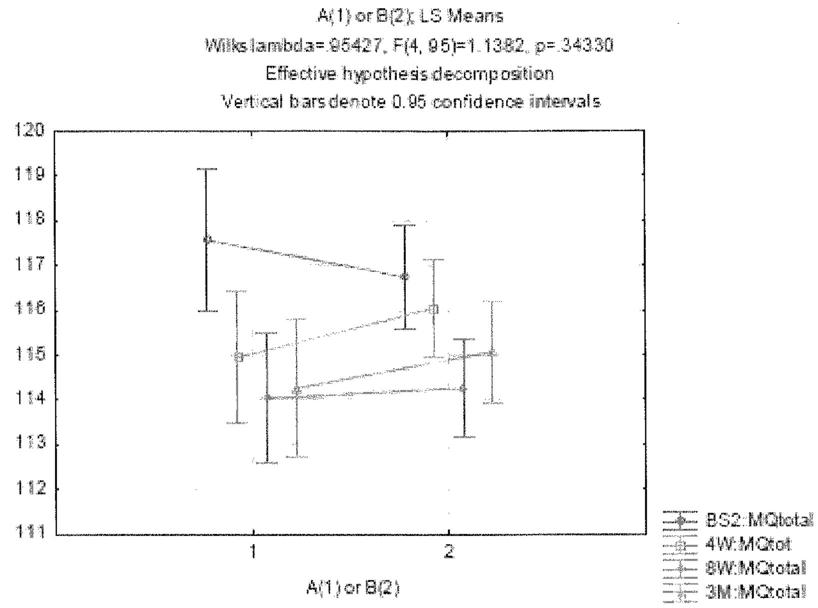
ANOVA for DERS scores

Effect	Multivariate Tests of Significance (statistica data recoded Sigma-restricted parameterization Effective hypothesis decomposition Test	Value	F	Effect df	Error df	p
Intercept	Wilks	0.055657	402.9706	4	95	0.000000
A(1) or B(2)	Wilks	0.974688	0.6168	4	95	0.651618



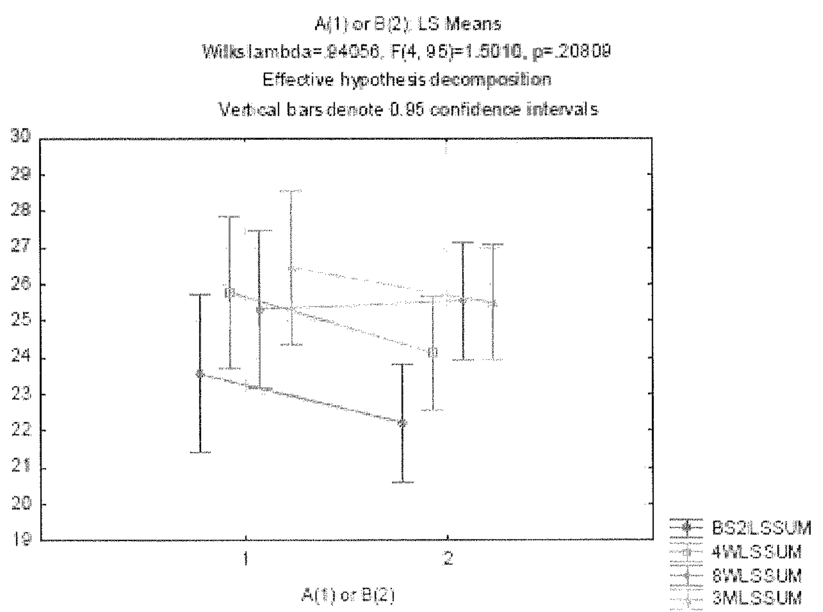
ANOVA for FFMQ scores

Effect	Multivariate Tests of Significance (statistica data recod Sigma-restricted parameterization Effective hypothesis decomposition Test	Value	F	Effect df	Error df	p
Intercept	Wilks	0.000923	25717.97	4	95	0.000000
A(1) or B(2)	Wilks	0.954266	1.14	4	95	0.343302



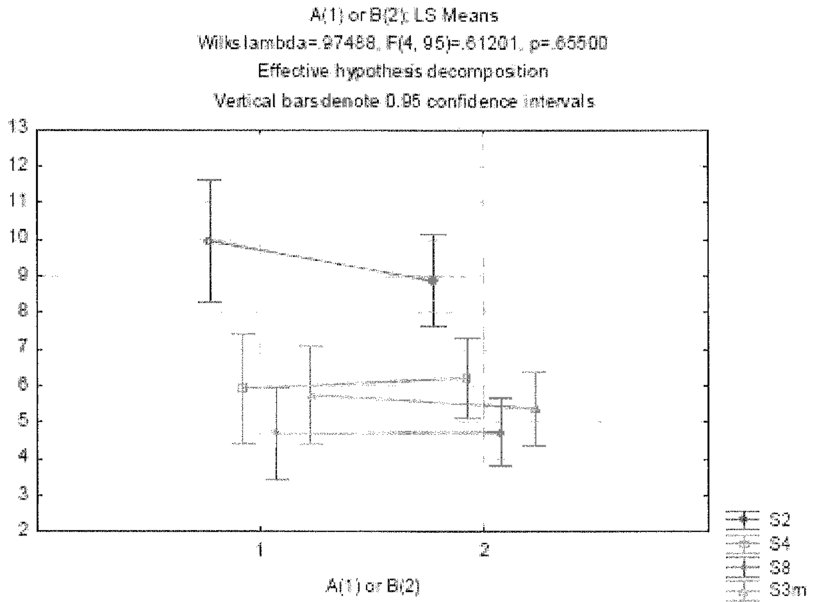
ANOVA for SWLS scores

Effect	Multivariate Tests of Significance (statistica data reco Sigma-restricted parameterization Effective hypothesis decomposition Test	Value	F	Effect df	Error df	p
Intercept	Wilks	0.052951	424.7760	4	95	0.000000
A(1) or B(2)	Wilks	0.940556	1.5010	4	95	0.208089



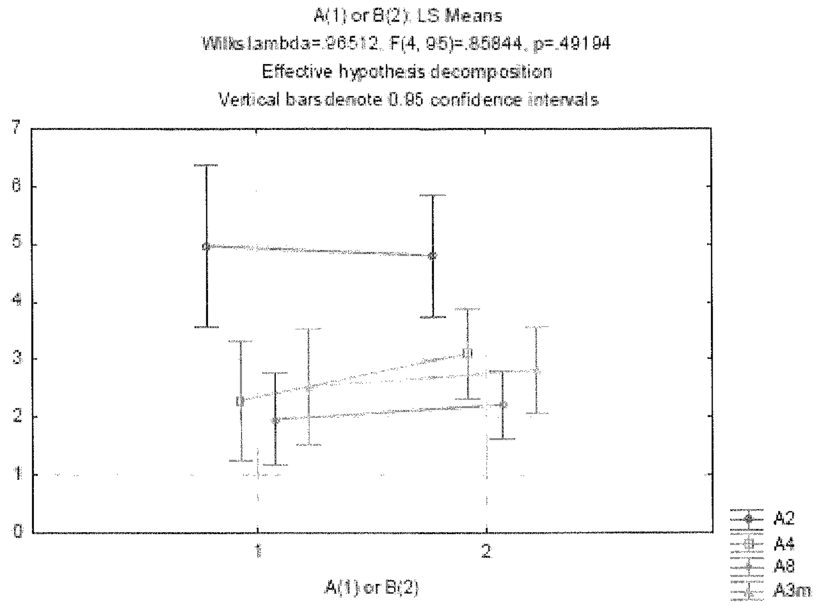
ANOVA for DASS Stress scores

Effect	Multivariate Tests of Significance (statistica data recoded Sigma-restricted parameterization Effective hypothesis decomposition					
	Test	Value	F	Effect df	Error df	p
Intercept	Wilks	0.220470	83.97438	4	95	0.000000
A(1) or B(2)	Wilks	0.974878	0.61201	4	95	0.654999



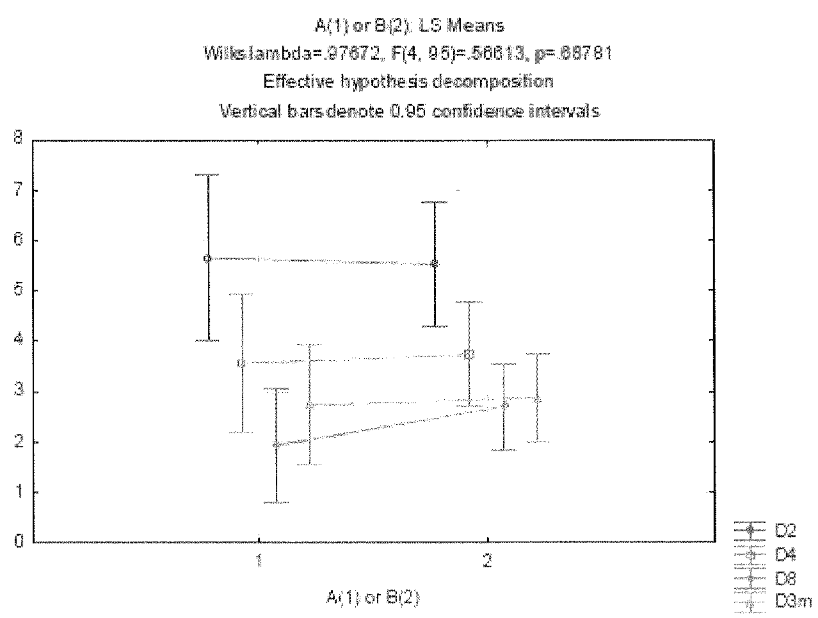
ANOVA for DASS Anxiety scores

Effect	Multivariate Tests of Significance (statistica data recode Sigma-restricted parameterization Effective hypothesis decomposition					
	Test	Value	F	Effect df	Error df	p
Intercept	Wilks	0.423893	32.27833	4	95	0.000000
A(1) or B(2)	Wilks	0.965116	0.85844	4	95	0.491944



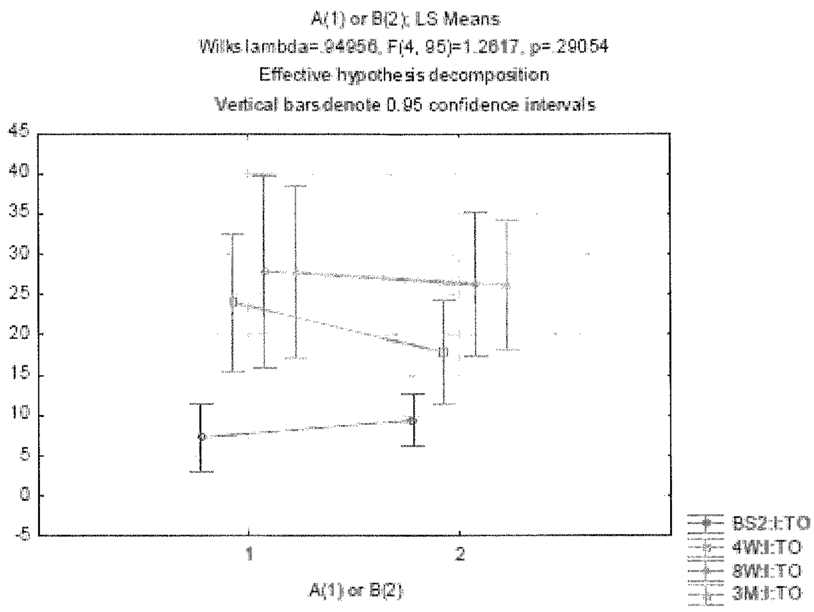
ANOVA for DASS Depression scores

Effect	Multivariate Tests of Significance (statistica data recod Sigma-restricted parameterization Effective hypothesis decomposition				
	Test	Value	F	Effect df	Error df	p
Intercept	Wilks	0.444330	29.70120	4	95	0.000000
A(1) or B(2)	Wilks	0.976718	0.56613	4	95	0.687813



ANOVA for Interoception scores

Effect	Multivariate Tests of Significance (statistica data recod Sigma-restricted parameterization Effective hypothesis decomposition					
	Test	Value	F	Effect df	Error df	p
Intercept	Wilks	0.552380	19.24574	4	95	0.000000
A(1) or B(2)	Wilks	0.949556	1.26169	4	95	0.290539



Appendix AB: Partial Correlations Looking at Relationship Between Group and Change on DVs Controlling for Meditation Practise

	Correlations (statistica data recoded DASS sc Marked correlations are significant at p < .05C N=68 (Casewise deletion of missing data)		
Variable	S.diff.base-8w	A.diff.base-8w	D.diff.base
group	0.240592	0.183487	0.20

	Partial correlations, controlling for: (statistica
	1
Variable	T:totalmins

	Partial Correlations (statistica data re Marked correlations are significant at N=68 (Casewise deletion of missing c			
Variable	Means	Std.Dev.	group	S.di
group	2.4118	0.49581	1.000000	
S.diff.base-8w	-4.6349	4.94798	0.164731	
A.diff.base-8w	-3.0588	3.79750	0.086466	
D.diff.base-8w	-3.3860	4.64536	0.182582	
EM.diff.base-8w	-26.4979	20.70580	-0.028007	
LS.diff.base-8w	2.9279	5.08213	0.101849	
MQ.diff.base-8w	-2.9553	5.77629	-0.145177	

	Partial correlations, controlling for: (statistica
	1
Variable	T:no. days

	Partial Correlations (statistica data re Marked correlations are significant at N=68 (Casewise deletion of missing c			
Variable	Means	Std.Dev.	group	S.di
group	2.4118	0.49581	1.000000	
S.diff.base-8w	-4.6349	4.94798	0.153487	
A.diff.base-8w	-3.0588	3.79750	0.090354	
D.diff.base-8w	-3.3860	4.64536	0.167017	
EM.diff.base-8w	-26.4979	20.70580	-0.063540	
LS.diff.base-8w	2.9279	5.08213	0.082200	
MQ.diff.base-8w	-2.9553	5.77629	-0.119042	